EFFECTIVENESS OF SENSORY INTEGRATION THERAPY ON MOTOR ACTIVITY AMONG MENTALLY CHALLENGED CHILDREN AT SELECTED SPECIAL SCHOOLS, SALEM

By

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"For thou art the glory of their strength:

and in thy favor our horn shall be exalted"

Psalms – 89 : 17

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXURES

ABSTRACT

A Study was done to Evaluate the Effectiveness of Sensory Integration Therapy on Motor activity among mentally challenged children at Selected Schools, Salem.

A quantitative research approach with quasi-experimental (pre test post test with control group) design was adopted. The settings of the study were Adharsh Thai Special School, Salem as experimental group and CSI Balar Gnana Illam, Salem as control group. 60 mentally challenged children with motor activity impairment in the age group of 6 -16 years were selected by purposive sampling technique. Data was collected from 04.09.2014 to 02.10.2014. Level of Motor activity was assessed by using structured observatory checklist. Sensory integration therapy was carried out in three stages 30 minutes a day by 6 groups consisting of 5 children in each for 21 consecutive days. Followed with 21 days of practice of the sensory integration therapy, post test was conducted on day 27^{th} and 28^{th} both in experimental and control group respectively. The data gathered were analyzed by descriptive and inferential statistical method. The findings revealed that during pre test, in experimental group, 9(30%) samples had mild motor impairment, 16(53.33%) had moderate motor impairment and 5(16.67%) had severe motor impairment. In control group, 5(16.67%) had mild motor impairment, 19(63.33%) had moderate motor impairment and 5(16.67%) had severe motor impairment. During post test, in experimental group 3(10%) had no impairment, 11(36.67%) of them had mild motor impairment, 11(36.67%) had moderate motor impairment and 5(16.67%) had severe motor impairment. In control group, 5(16.67%) had mild motor impairment, 19(63.33%) had moderate motor impairment and 6(20%) had severe motor impairment.

In pre test, the mean score of motor activity was 6.4±4.32, where as in post test, the mean score of motor activity was 8.6±3.89.The calculated 't' value was 5.60 which is greater than the table value of 2.05 at $p<0.05$ level which shows that the sensory integration therapy was effective in improving the level of motor activity. Hence hypothesis H_1 was retained. There was significant association ($p\leq0.05$ level) between the level of motor activity among mentally challenged children and their age in experimental group. Hence hypothesis H_3 was retained for above mentioned demographic variables. The study implies that Sensory Integration Therapy was effective for improving motor activity among mentally challenged children.

CHAPTER - I

INTRODUCTION

"Disability is not a brave struggle or courage in the face of adversity. Disability is an art. It's an ingenious way to live."

- Neil Mareus.

There are people who have poor and insufficient development of mental functions, including control over their body movements, their intelligence, social interaction and language, from birth to childhood. They are called as Mentally challenged children. **(National Institute of Mentally Challenged, 2010)**. According to **WHO (2011),** about 3-10% of children who suffer from mental retardation are mild and moderately challenged in this world. It is more common in developing countries because of the higher incidence of injuries and anoxia during the birth and early child hood period.

The best estimates of the prevalence of moderate mental retardation (IQ less than 50) in developed countries suggest that the rate is between 3 and 4/ 1000 persons. Mild retardation (IQ of 50- 70) is usually estimated to occur in 2-3/100 persons. The prevalence of moderate and mild mental retardation in developing countries is much less accurately known for a variety of reasons. Firstly very few relevant surveys have been carried out so far. Secondly there is often a lack of standardized measures of intellectual function and disability adapted to the needs of developing countries (WHO). In India the prevalence of mental disability was found to be 2.3%. The prevalence was higher among females (3.1%) than males (1.5%). **(Indian Psychiatric Society, 2010)**

Mental retardation is classified in to four levels namely: mild, moderate, severe, and profound. These levels are determined by performance on standardized IQ

tests and by the child's potential to learn adaptive skills such as communication and social interaction. In mild mental retardation the IQ levels are 55 to 69, in moderate mental retardation the IQ ranges from 40 to 54, in severe it ranges from 20 to 39 whereas in profound the IQ levels are 0-24. **(ArmatasV, 2009)**

Children with mild mental retardation are often slower to walk, talk, and feed themselves than most other children. They can learn practical skills, including reading and math, up to fourth or sixth grade level. Children with moderate mental retardation show noticeable delays in developing speech and motor skills, they can learn basic communication, some health and safety habits, and other simple skills. They cannot learn to read or do math. Children who were severely retarded can be diagnosed at birth or soon after. During preschool age, they show delays in motor development and little or no ability to communicate. With training, they may learn some self-help skills, such as how to feed and bathe themselves. Children who are profoundly retarded are usually diagnosed at birth, and they may have other medical problems and need nursing care, continuous supervision. These children show delays in all aspects of development. With training, they may learn to use their legs, hands, and jaws. They cannot take care of themselves and need complete support in daily living. **(Agnihotti, 2010)**

In the mid – 1800s many children with mental retardation were placed in residential education facilities in conjunction with the belief that if these children received sufficient intensive training, they would be able to return to their families and function in society at a higher level. So they could overcome their disabilities was not realized. Gradually these residential programs became larger and eventually the focus began to shift from intensive education to custodial care. **(Kaplan and Sadock's, 2011)**

About 87% of the mentally challenged children will only be a little slower than average in learning new information and skills. During the childhood period it may be difficult but when they become adults, many mild mentally challenged people can lead their life independently. The remaining 13% of the mentally challenged people score below 50 on IQ tests. These people will have more trouble in school, at home and in the society. A severely mentally challenged individual will need more support throughout his entire life .Every mentally challenged child is able to learn, so they can lead a satisfying life. **(Institute of Child Health Development, 2010)**

When the mentally challenged have difficulty in adjusting to the demands of society, the problem is usually related to limited intellectual capacity, and an inability to understand what society expects of its members. When the mentally ill fail to adjust to society's demands, it is often because their mental disorders have caused them to lose touch with reality or their emotions interfere with so called normal responses.

However, the mentally challenged also may have emotional problems; they can become mentally ill through frustration born of repeated failures, the humiliation of being ridiculed and the fears that come from trying to survive in a highly complex and somewhat impersonal world. Parents can contribute to frustrations by over protectiveness which keeps retarded children dependent or the parents may be overambitious, pushing their children beyond their intellectual and emotional capacities. **(U.S. department of Health, Education and Welfare, 2013)**

Educational settings for children who are mentally challenged should include a comprehensive program that address training in adaptive skills, social skills and vocational skills. Particular attention should focus on communication and efforts to improve the quality of life of mentally challenged children. **(Bhattacharya-Kolkata, 2013)**

Children who are mentally challenged are capable of learning a great deal; however they often need to be taught systematically and creatively in order to master certain skills. Many life skills such as bathing, dressing, toileting, cleaning, washing, preparation of food etc are need to be taught and practiced multiple times to help them independently participate in daily routines and activities. With the right environment and training program, mentally challenged children show improvements in current life skills and begin to make progress with new skills. **(Michaela Davila, 2009, Newzeland)**

Mentally challenged children learn more slowly than a normal child. It is helpful to break down learning tasks in to smaller steps and to introduce each learning task, one step at a time, to avoid over burdening the child. Once the child has learnt and mastered one step, the next step has to be introduced. Lengthy verbal instructions are not effective in dealing with mentally challenged child. Mentally challenged child learn best when the learning experience involves concrete, visible information rather than abstract lectures. **(CGC Janseen, 2011)**

A loving home atmosphere can help most of the mentally Challenged children to feel encouraged and motivated to make improvements in themselves. It is very important to teach mentally Challenged child the basic skills of life like dressing by self, using the toilet properly, taking a bath, grooming by self than to teach him/her science or mathematics. These skills would be very useful for mentally challenged child in life and make it a rule to praise mentally challenged child when he performs well so that he /she feels motivated to improve himself or herself. **(Association for Mentally Challenged, 2013)**

Need for the Study

About 5% of the world's children, 14 years of age and under are mild to moderate mentally challenged. **(WHO, 2010)**

In India, around 6,995 people in rural and 2,951 people in urban were mentally challenged. **(National Sample Survey Organization, 2012)**

The census report of 2011 in India reveals that about 1,27,521 population were mentally handicapped in Tamilnadu.

Mild mental retardation is much more common than severe mental retardation, accounting for 65 to 75% of all cases with mental retardation. In other words, in a village of 1000 people, of the 20 who will have mental retardation, about 15 will have mild mental retardation and about five will have more severe forms.

Child line India Foundation, (2008) published a study on mentally challenged children in Maharashtra. From three levels, information was collected in every Village, Taluk and District. Findings of the study revealed that in 24% of mentally challenged children, one parents was mentally challenged.11% of mothers of mentally challenged children were below eighteen years .36% of mothers reported complications during pregnancy and 41.2% of them were reported with stress. Only 8% of the mentally challenged children attended school up to grade VII.33% of parent didn't allow their children to interact with other children due to the social stigma.

Mb Wilo G.S.K, (2005) conducted a study on family perception in caring children and adolescents with mental disability. Samples were chosen through convenient sampling. The result of the study revealed that deficient knowledge about mental disability and they did not receive adequate health care. The study suggested that well worked out strategy would improve health care of children and adolescents with mental disability through provisions of guidance and supervision to the families.

The causes of mental retardation include chromosomal abnormalities, metabolic disorder, cranial malformations, endocrine disorder, infection, intoxication, inadequate nutrition, physical damage and trauma.

Mental retardation means substantial limitations in age-appropriate intellectual and adaptive behavior. It is seldom a time-limited condition. Although many individuals with mental retardation make tremendous advancements in adaptive skills (some to the point of functioning independently and no longer being considered under any disability category), most are affected throughout their life span. **(Hawkins, Eklund, James & Foose, 2007)**

Each individual with mental retardation has unique problems based on the severity of condition and the ability to cope up with the problem. Children with mental retardation generally have problems in: motor coordination, carrying out day to day activities like toileting, bathing, reading, writing, arithmetic, communication, behavior, and socialization. Some mentally retarded individuals may also have sensory defects such as visual impairments, hearing loss or other problems like epilepsy / fits. **(WHO, 2012)**

Children with mental retardation have motor impairments in two forms namely: gross motor and fine motor. In gross motor the children have difficulties such as: Poor timing, problems in chewing, poor balance (sometimes even falling over in mid-step), difficulty combining movements into a controlled sequence, difficulty remembering the next movement in a sequence, problems with spatial awareness or proprioception, trouble picking up and holding onto simple objects such as pencils, owing to poor muscle tone, difficulty in determining left from right and a shift in the preferred hand. The fine motor impairments cause difficulty with a wide variety of other tasks such as using a knife and fork, fastening buttons and shoelaces, cooking,

brushing one's teeth, styling one's hair, shaving, applying cosmetics, opening jars and packets, locking and unlocking doors, doing housework and problems with handwriting. **(David Perlstein, 2014)**

Mild and moderate mentally challenged children have deficits in cognitive functioning and learning styles which include poor memory, slow learning rates, attention problems, difficulty generalizing what they have learned and lack of motivation.

Intellectual disability is fairly common, and it occurs in approximately 1 to 2% of people. Psychiatric and behavior problems occur three to six times more in these individuals than in the general population. Individuals will show signs of difficulty in two areas of adaptive skills, such as social skills, health or safety. Other behavioral problems include: Self-injurious behavior, Physical aggression toward people or destruction of property, Impulsivity/hyperactivity, Suicidal ideation/behavior, Sexually aggressive behavior, Sexual self-exposure/public masturbation, Social withdrawal, Excessive dependency and Noncompliance/oppositional behavior. **(Albert Claw, 2009)**

Mentally challenged children have problems in Motor activity such as impairment in lying, sitting, standing, walking, jumping and crawling. Some of the therapies commonly used for promoting motor activity includes, Behavior therapy, occupational therapy, human development training, sensory integration therapy, life skills training, individual training programs and special educational programs.

Among these therapies, the researcher selected sensory integration therapy for promoting motor activity of mentally challenged children.

Sensory integration or sensory processing therapy is a term that refers to the way the nervous system receives messages from the senses and turns them in to

appropriate motor and behavioral responses. It is a form of therapy in which the therapist may encourage a child with crawling, skipping, playing musical instruments, playing catch and bouncing balls with both hands to help with bilateral integration. Sensory integration therapy usually focuses on the following areas: tactile (sense of touch), vestibular (sense of movement) and proprioceptive (sense of body position).The typical goal of sensory integration therapy is to help the child re-organize or re-process sensory information in order to have a more accurate response to external stimuli. **(American Association of Occupational Therapy, 2012)**

Auditory activities include talking toys, games on computers, musical instruments, squeaky toys and all sorts of music, Clapping together and telling rhymes. Hand and eye coordination can be improved with activities such as hitting a ball with a bat, popping bubbles, throwing, catching balls and balloons. Proprioceptive activities include jumping, standing and crawling. Other activities are playing games that require precise hand and finger control, drawing, painting and coloring, manipulating buttons and snaps, putting small objects together, doing puzzles, placing rings, using scissors, manipulating small objects such as coins, opening and closing objects, picking up and holding onto small objects, pinching objects between fingers. Sensory integration activities are the lifeline to providing and achieving the necessary challenges for the child so they maximize: daily functioning, intellectual, social, and emotional development, the development of a positive self-esteem, a mind and body which is ready for learning, positive interactions in the world around him, the achievement of normal developmental milestones. **(Shani, 2012)**

Mentally challenged children are burden to self, family and society. Sensory integration therapy helps to promote the motor activity thereby reducing the burden of mentally challenged.

NMA Loan.et.al, (2008) conducted a study on Sensory integration therapy for children with mental retardation. The research group consisted of 78 children and study was carried out for a period of 2 months. Check list was used to analyse the motor activity of the children. The children those who received sensory integration therapy has marked improvement in their motor activities. Study revealed that sensory integration therapy will influence the motor activity of the mentally challenged children.

From the above data's, the researcher found that the mentally challenged children have problems in their motor activities such as lying, sitting, standing, running, jumping, crawling and walking.

The investigator felt that the above problems need to be shapen to reduce the burden of self or children, family and society. So the investigator selected this study to evaluate the effectiveness of sensory integration therapy on motor activity among mentally challenged children.

Statement of the Problem

A Study to Evaluate the Effectiveness of Sensory Integration Therapy on Motor Activity among Mentally Challenged Children at Selected Special Schools, Salem.

Objectives

1. To assess the level of motor activity before and after administering sensory integration therapy among mentally challenged children in experimental and control group.
2. To determine the effectiveness of sensory integration therapy on motor activity among mentally challenged children in experimental group.
3. To associate the levels of motor activity among mentally challenged in experimental and control groups with their selected demographic variables.

Operational Definitions:

Effectiveness:

It is the outcome of Sensory integration therapy on motor activity by measuring the pre test and post test scores by inferential statistical method.

Sensory Integration Therapy:

It is a type of therapy in which senses such as vision, hearing and touch are integrated for improving motor activity of mentally challenged children.

Motor activity:

Motor activity refers to the coordination of activities which includes lying, sitting, standing, crawling, walking and jumping and is measured by structured observatory checklist.

Mentally challenged:

It refers to children who were already diagnosed as mild and moderate mentally challenged and residing at special school with impairment in motor activity .

Assumptions

1. Mentally challenged children may have disturbances in motor activity.
2. Level of motor activity may vary from individual to individual.
3. Use of Sensory integration therapy may help to improve motor activity.

Hypotheses

H_1: There is a significant difference in the level of motor activity in experimental group before and after sensory integration therapy among mentally challenged children at $p \leq 0.05$ level.

H_2: There is a significant difference between post test scores of motor activity among mentally challenged children in experimental and control group at $p \leq 0.05$ level.

H_3: There is a significant association between the pretest level of motor activity and their selected demographic variables of mentally challenged children in experimental and control group at $p \leq 0.05$ level.

Delimitation

1. The data collection period was limited to 4 weeks.
2. The study was limited to the mild and moderate mental challenged children.

Projected Outcome

1. The study would help to identify the level of motor activity among mentally challenged children.
2. Sensory integration therapy would improve the level of motor activity among mentally challenged children.
3. The findings of the study would help the health professionals to gain knowledge and practice sensory integration therapy effectively.

Conceptual Framework:

A conceptual framework can be defined as a set of concepts and assumptions that integrate into meaningful configuration (Faweet, 1994). Mentally challenged children are the target population of this model. The present study aims for improving the motor activity among mentally challenged children. The conceptual framework adopted for this study is Widenbach's Helping Art of Clinical Nursing Theory (1964). This theory has three factors, when these three factors are not set forth clearly which may not help prompt the intervention.

1. Central purpose
2. Prescription
3. Reality

1. Central purpose:

It refers to what the nurse wants to accomplish. It is the overall goal towards which a nurse strives. And also it is based on the nurse's personal philosophy. In this study, the central purpose is improvement of motor activity among mentally challenged children.

2. Prescription:

It refers to the plan of care for a patient it's specify the nature of an action that fulfill a nurses central purpose. The nurse can implement it through the nursing care plan. The prescription in this study is Sensory integration therapy.

3. Reality:

It refers to the physical, physiological, psychological, emotional and spiritual factors that come in to play in a situation involving nursing action

The five realities identified by Weidenbach's are agent, recipient, goal, means and framework.

The conceptual framework consists of three steps:

Step 1: Identifying the need for help.

Step 2: Ministering needed help.

Step 3: Validating that the need for help was met.

Identifying the need for help:

Identification involves viewing the patient as an individual with unique experiences and understanding the person's perception of the condition. Identification determines a person's need for help based on the existence of a need whether the person realize the need, what prevents the person from meeting the need and whether the person can meet the need alone. Here the investigator identifies the motor activity of the mentally challenged children through structured observatory checklist and their related variables.

Ministering needed help:

Ministration refers to the provision of needed help. It requires an identified need and a person who wants help. Identified need of motor impairment and the investigator willing to increase the motor activity. There are five realities (agent, recipient, goal, means and frame work) come in to play in a situation involving nursing actions.

The Agent:

The agent directs all actions toward the goal. Here the investigator is the agent.

The Recipient:

The recipient is the one who receives nurse's actions or on whose behalf actions are taken; the recipient is vulnerable and dependent. Mentally challenged children with motor activity impairment are recipient here.

The Goal:

The goal is the investigator's desired outcome; it directs actions and suggests the reasons for taking those actions. The goal of this study is to improve the motor activity among mentally challenged children.

The Means:

The means are the activities and devices used by the investigator to achieve the goal. In this study along with routine activities mentally challenged children received sensory integration therapy.

The Framework:

The framework refers to the facilities in which nursing is practiced; it comprises human, environmental, professional and organizational aspect of care. In this study the activities are practiced in the selected special school, Adarsh Thai special school, Salem.

Validating the need for help was met:

Validation refers to a collection of evidence that shows a patient needs have been met and that his functional ability has been restored as direct result of nurse's action. Here the validation is done by the investigator by reassessing the motor activity among mentally challenged children to know the impairment in motor activity.

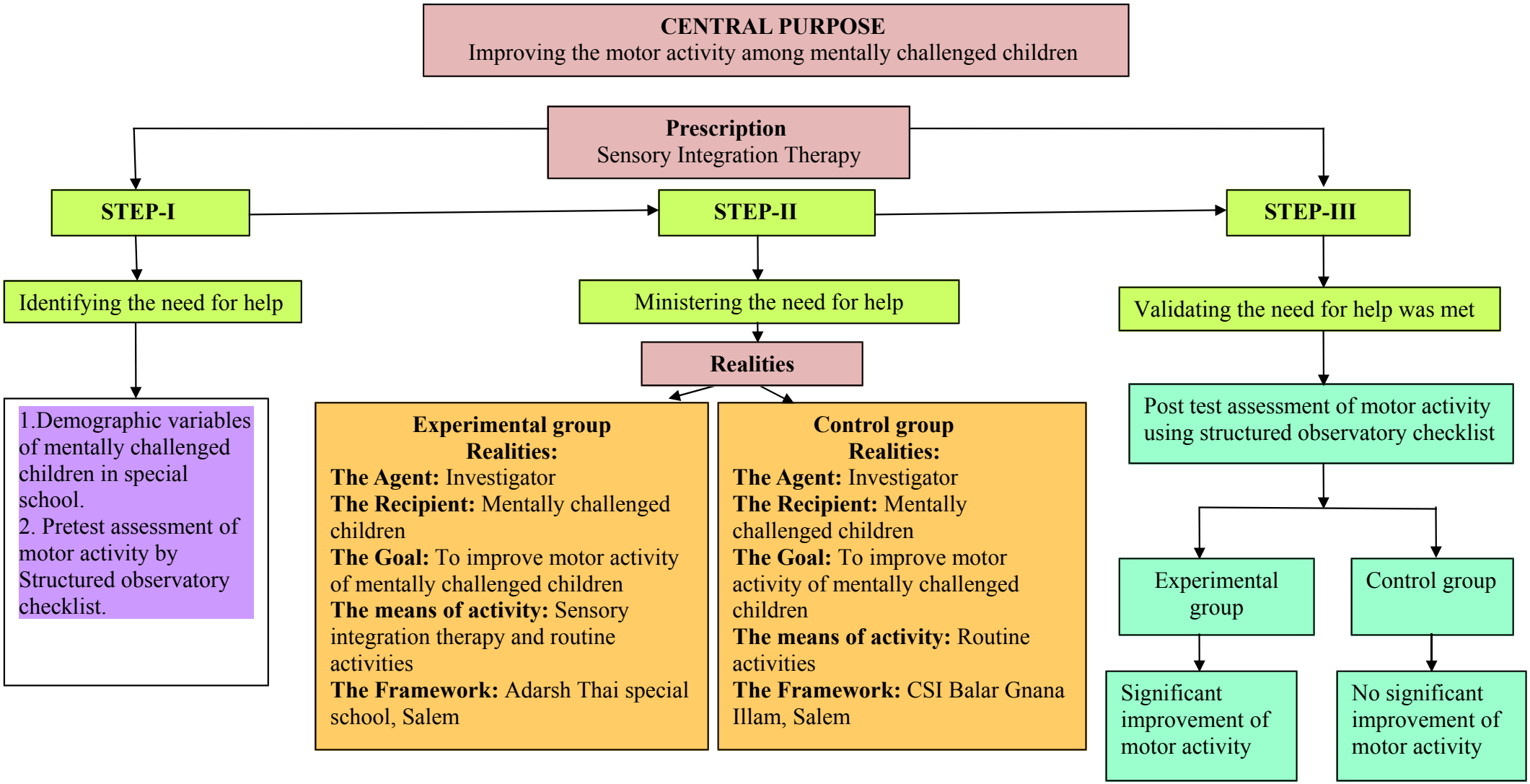

Figure-1.1: Modified Weidenbach's helping art of clinical nursing theory On Effectiveness Of Sensory Integration Therapy On Motor Activity Among Mentally Challenged Children.

Summary

This chapter dealt with introduction, need for the study, and statement of the problem, objectives, hypotheses, operational definitions, assumptions, delimitations, projected outcome and conceptual framework.

CHAPTER- II

REVIEW OF LITERATURE

Review of literature is an essential step in the development of a research project. It helps the researcher to design the proposed study in a scientific manner so as to achieve the desired result. For both qualitative and quantitative research, a literature review is important for developing a broad conceptual context in to which a research problem will fit. It helps to determine the gaps, difficulties, strength and weakness in the available literature about particular subject under the study.

Review of literature for the present study is classified under the following headings

1. Literature related to Motor activity among mentally challenged children.
2. Literature related to Effectiveness of Sensory Integration Therapy on Motor activity among mentally challenged children.

1. Literature related to Motor activity among mentally challenged children:

Vujik.P.J., (2013) conducted a comparative study on motor performance of children with mild intellectual disabilities (MID) and borderline intellectual functioning (BIF) at selected special school, Jarkhand .The present study aims to compare the motor skills of children with intellectual disability (ID) to the abilities observed in typically developing children and also to determine whether there is association between degree of ID and motor performance. A total of 170 children between 7 and 12years old with MID or BIF, who attended school for special education, were selected as samples by non-probability convenient sampling technique. The children were examined on the test component of the Movement Assessment Battery for Children (MABC) test. Both groups were compared with the norm scores of the total score, sub scale scores and individual items of the MABC test. Results Of the children, 81.8% with MID and 60.0% with BIF performed below

the 16th percentile on the total score of the MABC. The data was analysed by ANOVA and the result showed that Children with ID had significant association in developing motor problems than the normative sample and there was an association between degree of ID and performance of manual dexterity, ball skills and balance skills at p(≤0.05) level. This study concluded the importance of improving motor skill performance in both children with borderline and mild ID.

Barbara.H. Conolley., (2013) conducted a study to examine the gross motor and fine motor abilities of children with mental retardation using the Bruininks Oseretsky Test of Motor Proficiency to compare the motor skills of 24 mentally retarded children, 12 with Down syndrome and 12 without Down syndrome. The children ranged in chronological age from 7.6 years to 11 years and were of comparable mental age. Within each group, there were no significant sex differences nor were there differences between the two groups in motor performance for the male subjects. The female subjects with Down syndrome, however, scored significantly lower than female subjects without Down syndrome on running speed, strength, visual motor ability, speed, and dexterity and fine motor composite scores. The data was analyzed by structured checklist. As a group, the children with Down syndrome scored significantly lower than the children without Down syndrome in the areas of running speed, balance, strength, and visual motor control. The study concluded that motor skills were significantly lower for the children with Down syndrome than for the children without Down syndrome.

Abbas Taghi Pour Javan., (2012) conducted a study to find the efficacy of rhythmic play (dancing) on mentally retarded children's motor activity in Children at the age group of 9 to 16. True experimental design was used in this study i.e. pretest - posttest control group design where 20 children with Mental Retardation were

selected using multistage random cluster sampling (each group consists of 10 children). The researcher gave rhythmic bodily movements (dancing) as an intervening program to experimental (case) group twice a week (45 minutes for each session) for three months. The instrument of this research included Canners neuropsychological test of NEPSY, Raven Colored progressive matrixes for children and Vinland adaptive behavior scale questionnaire. Data was analyzed by Multivariate. The results from the present study showed that rhythmic play shows improvement in the motor activity and general learning in partially mental Retarded children.

Tri Anni Hastuti, (2011) conducted a study to identify the level of motor skills development of the preschool participants with mental retardation and/or developmental disorders according to the movement assessment battery for children (MABC). The sample of 36 children between the ages of 48 and 79 months were selected from a kindergarten by convenience sampling technique, were diagnosed with mental and/or behavioral disorders. The data was analyzed by independent 't' test. The quantitative results of this research revealed great differences between fine and gross motor skills, great differences in assessed items related to the individual diagnosis of each child.

Nisha.C.Jacob., (2009) conducted a study to assess the effectiveness of art therapy on motor activity among mentally challenged children, New Delhi. Children from certain special schools participated in 28 art tasks over a 7-week period significantly improved the participants drawing scales for a self portrait. These art therapy programs provided appropriate means of expression of anger and frustration and it also increased one's self esteem and motivation. The result showed that there was also a significant increase in the patients' scores on the Illinois Test of

Psycholinguistic Abilities in areas of visual reception, visual closure, visual associations, visual memory, manual expression, and receptive/expressive tasks.

Sri Winarni, (2008) conducted a study to know the fine motor skills level of educable mental retardation of elementary level students in Sayidan State Special School, Yogyakarta. The research design was using descriptive quantitative with survey and test instrument was design to collected the data. Fine motor skills test used in this research was motion control test with 0.913 in validity and 0.80 in reliability. The research result showed that the fine motor skills level of educable mental retardation of elementary level students in Sayidan State Special School Yoga kartawas in underprivileged level.

Suresh.A.,et.al., (2008) conducted a study to identify the motor skills, work traits and aptitude of people with mild and moderate mental retardation from regular and special schools. Further, it explores the relationships between motor skills and aptitudes, as well as work traits and aptitudes of people with mild and moderate mental retardation from different schools. The sample for this study consists of 19 persons with mild mental retardation and 26 with moderate mental retardation. Twenty five persons had studied in regular schools before they started their vocational training, while the other 20 had studied in special schools. They were assessed for motor skills, work traits and aptitude. Analysis of variance (ANOVA), correlation co-efficient and critical ratio between the co-relations were used on the data to test the hypotheses. This paper highlights the implications of the findings for the future.

Gayatri Sankaranarayanan., (2008) has reported in an article of the Hindu News paper on the title ‘the dot’ that has therapeutic effect on fine motor activity of mentally challenged children. She has selected 50 samples of mild mentally retarded children of Ramakrishna Mission Vidyalaya by non- probability purposive sampling

technique. Motor activity was assessed using structured questionnaire. She introduced kolam patterns in the middle of class room. The researcher created simple shapes such as circles, stars and flowers. After one month intervention she finds out a significant improvement in the fine motor activity. It reveals that there is 30% increase of fine motor activity among mild mentally challenged children. The study findings shows with mean =14.98 and SD =9.20. The result showed significant improvement in the motor activity (p=0.01) after the intervention.

Hon. Brig, et.al, (2007) conducted a case study in Australia on motor skills and early intervention for preschoolers (4-6.5 yrs) with mental and developmental disorders (N=6) in a special kindergarten aimed to propose individualized intervention programs, the quantitative results of this research revealed great differences between fine and gross motor skills, and the study proposed that intervention plans could be accomplished through the implementation of common games as drawing, small toys manipulation, ball games, running and jumping.

Polatajko, (2007) conducted an experimental study in Australia which aimed to investigate construct validity of the Assessment of Children's Hand Skills (N=53) in children with intellectual disabilities. External construct validity was examined by correlating with 3 questionnaires evaluating daily living skills and hand skills. Analysis suggested that all 22 activity items and 19 of 20 hand skill items in the Assessment of Children's Hand Skills measured a single construct. Moderate to high correlations ($0.59 \leq$ Spearman's ρ coefficients ≤ 0.89, $P < 0.01$) were found with the assessments of daily living and fine motor skills.

2. Literature related to Effectiveness of Sensory Integration Therapy on Motor activity among mentally challenged children:

Law Miller, (2014) conducted a quasi experimental study to compare the effect of sensory integrative therapy, neuro developmental treatment and perceptual motor approach on children with mild mental retardation, Taiwan. The children (N=20) were randomly assigned to interventions with sensory integration(SI), neurodevelopment treatment (NDT), perceptual motor therapy(PM) and another 40 children served as control participants .The data was analysed by paired 't' test. The experimental group demonstrated a greater pretest-posttest change of mean= 17.87 to a mean =24.87 within 15 days of 2 hours duration daily in a day camp care on fine motor activity. The study shows significant improvement in motor activity ($p \leq 0.05$) level.

Bipin.P, (2013) conducted a quasi experimental study to assess the effectiveness of sensory integration therapy on motor activity among mentally challenged, Kerala. Sixty moderately mentally challenged children were selected by using convenient sampling technique. Samples were segregated into two groups(n=30).pretest was carried for 2 days followed by sensory integration therapy for a period of 21 days and the children were assessed for the motor activity after 21 days by Diamme Russelss GMFM(Gross Motor Function Measure) score sheet. The activities such as reaching the objects, jumping over swiss board, ball catching, skipping, climbing the ladder and placing the rings through which senses like vision, hearing and touch were integrated. The study result shows that the mean value of pre test and post test level of motor activity was 62.80(S.D=12.5) and 62.77(S.D=10.68) respectively in the control group and it was 62.66(S.D=12.5) and 79.08(S.D=5.67) respectively in the experimental group. The overall independent 't' value was

significant at the level of $p<0.001$.This shows that there was a significant level of improvement in the level of motor activity among mentally challenged children who had undergone sensory integration therapy.

Eikelman., (2013) conducted a quantitative study to assess the effectiveness of sensory integration therapy on fine and gross motor activity among moderate mentally challenged children, Korea. Totally 57 mentally challenged children were selected as samples by non-random convenient sampling. The motor activity was assessed using structured questionnaire. Duration of intervention is weekly thrice for half an hour for an average of 5 weeks. The collected data were analysed by inferential statistics .The initial mean was 107 and after intervention was 134 and the difference was 27 which was significant at $p<0.05$ level. He concluded that sensory integration therapy is essential in improving motor activity.

Jillian, (2013) conducted a quasi experimental study to assess the effectiveness of Sensory integration therapy on level of motor activity among mentally challenged children at St. Hendry's special school, Mangalore . Total of 30 samples were selected by non- probability convenience sampling technique. Analysis shows that overall mean percentage post-test level of motor activity score (51.57%) was greater than the mean percentage pre-test level of motor activity score (30.57%). The paired 't' value was 13.58, and the table value was 2.045, which showed it was significant at $p\leq0.05$ level.

Meenakshi, (2013) conducted a Quasi experimental study to compare the effectiveness of sensory integration therapy and Wilbarger technique in children with mental retardation in AWWA School, New Delhi. The duration of the study was one month. 42 Subjects who matched on the basis of IQ, age, sex, diagnosis and motor activity were selected as samples. Baseline testing was done by checklist based on the

performance of tasks of ball catching, jumping and crawling accordingly. After baseline evaluation they were divided in to two groups. Group A underwent the sensory integration therapy and group B underwent the Wilbarger technique. Wilbarger technique is a technique in which the child's body was brushed periodically to desensitize them to touch. After 6 sessions, scoring was done on the same task on which the subjects were trained. Statistical interpretation for fine motor activity of group A, the mean score was 5.76 ± 1.37, group B mean score was 5.7 ±1.99. For gross motor mean activity score for group A was 3.95±1.58, group B was 3.76 ±1.48,'t' value was 1.3%. 't' value was 0.30 which was significant at $p \leq 0.05$ level. The result concluded that both the sensory integration therapy and Wilbarger technique are equally effective for improving motor activity in children with mental retardation.

Schaffer, (2012) conducted a quasi experimental study to assess the effectiveness of sensory stimulation therapy on motor activity among mentally challenged children at school for mentally challenged, Lucknow. A sample of 30 mentally challenged children were selected by using non probability convenience sampling technique after assessing the gross and fine motor skills with a observatory check list. The sensory integration therapy was conducted for 20 minutes, twice a day in a week for 4 weeks. The motor activity was assessed using structured questionnaire at the end of 4 weeks. The study findings shows with mean =24.98 and SD =9.26. The result concluded that sensory integration therapy was effective in improvement of motor activity at $p \leq 0.01$.

Hayers, (2011) conducted a study to assess the effectiveness of sensory integration therapy on fine motor activity among mentally challenged children, Norwegia. The purpose of the study was to describe the effectiveness of sensory

integration therapy on fine motor activity. The Movement Assessment Battery for Children (MABC) test was administered twice during 6 weeks, before and immediately after the intervention. The sensory integration therapy was given for a period of thrice in a week for 6 weeks. The mean Movement Assessment Battery for Children (MABC) test score increased 10.2 points from pre-test score of 68.8 to post test of 79. He concludes that 6 weeks of sensory integration therapy was effective in improving the motor activity of mentally challenged children.

Venoort F.V, et.al, (2010) conducted a quasi experimental study to assess changes in motor activity by sensory integration therapy, Chattisgarh. The purpose of the study was to find out the changes in motor activity during the intervention of sensory integration therapy. An intervention with a single-group design was repeated with different samples in successive months (n = 46). In each month, five groups of 3–7 participants went through the intervention. Data were collected before, twice during and immediately after a 12-week sensory integration therapy. Motor activity was assessed by using the structured questionnaire. The result showed that 38% of the participants had increased motor activity after the intervention.

Marianne Thorsen, (2010) conducted a study on effectiveness of sensory integration therapy on motor activity of mentally challenged children in selected special school, South Korea. The purpose of the study was to assess the changes in motor activity among the mentally challenged children after 4-week of sensory integration therapy. Non-probability purposive sampling technique was used and the samples selected were n=18.The modified Dimmen Russels GMFM (Gross Motor Function Measure) were administered before and after sensory integration therapy. The mean score of modified Dimmen Russels GMFM score increased 10.2 points from pretest 68.8 to posttest 79.0. The greatest change in modified Dimmen Russels

GMFM scores occurred in the initial weeks of the intervention. He concludes that the 4 weeks of sensory integration therapy may increase the motor activity of mentally challenged children.

Zbytniewski. R, (2008) conducted a prospective case-control study to find the effects of sensory integration's Wilbarger technique on motor activity among mentally challenged children. A total of 126 infants with extremely low birth weight (ELBW; <1000 g) were enrolled in order to examine the effect of occupational therapy based on sensory integration (SI) on motor activity. The children were grouped as matched pairs on the basis of determined motor impairment scores assessed at the age of 3 months. The intervention children had a 6-month period of weekly occupational therapy from the corrected age of 6-12 months. The follow-up showed that the social development of the intervention children was significantly better at the age of 12 months, but at the age of 2 years the groups had equal developmental scores in neurological, neuropsychological and speech therapy assessments. The Miller assessment for pre-schoolers (MAP) performed in a total of 96 (92%) of the study children at the age of 4 years failed to demonstrate any significant differences between the groups. It is concluded that this amount of occupational therapy in ELBW infants does not have any detectable effect on long-term motor development.

Summary

This chapter dealt with the review of literature related to motor activity among mentally challenged children, effectiveness of Sensory integration therapy on motor activity.

CHAPTER -III

RESEARCH METHODOLOGY

The methodology of research indicates the general pattern of organizing the procedure for gathering the valid and reliable data for the purpose of investigation. **(Polit D.F, and Hunger, 2003)**

The present study aims to evaluate the Effectiveness of sensory integration therapy on motor activity among mentally challenged children in selected special schools, Salem.

Research Approach:

The research approach adopted for this study was Quantitative Approach.

Research Design:

The research design chosen for this study was Quasi Experimental Pretest Posttest with Control Group Design. The design can be represented as:

$$E = O_1 \quad X \quad O_2$$

$$C = O_1 \qquad O_2$$

E = Experimental group.

C = Control group.

--- = No randomization

O_1 = Pre-test.

O_2 = Post-test.

X = Intervention (Sensory integration therapy)

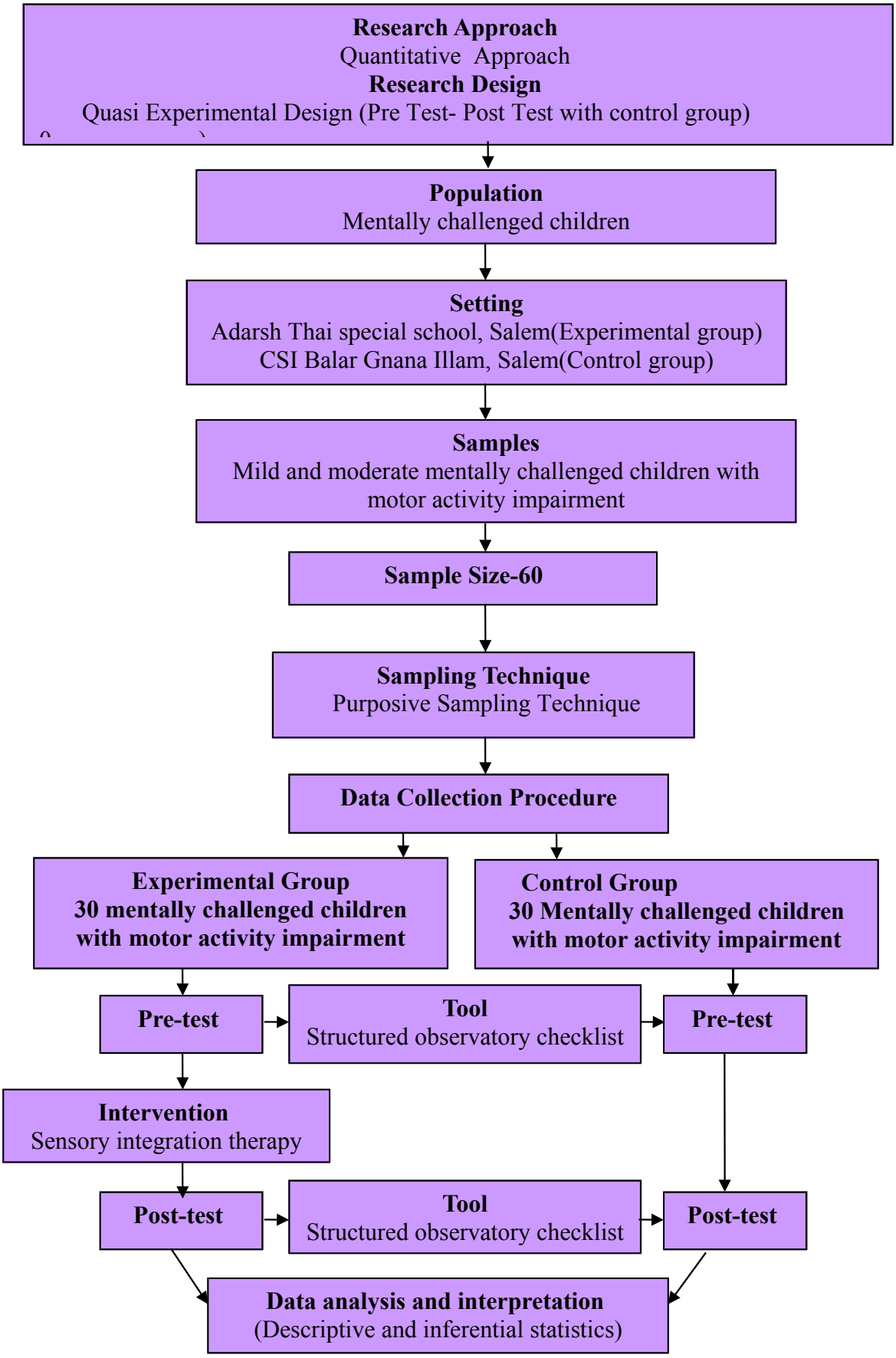

Fig. 3.1: Schematic Representation of Research Methodology

Population:

Population is defined as the entire set of individuals or objects having some common characteristics. **(Polit D.F & Beck Tatano Cheryl, 2008)**

The study population comprises of mentally challenged children at selected special schools, Salem.

Description of the Setting:

Setting is the physical location and conditions in which data collection takes place in a study. **(Polit D.F & Beck Tatano Cheryl, 2008)**

The study was conducted in Adarsh Thai special school and CSI Balar Gnana Illam, Salem. Adarsh Thai special school is a experimental group setting which is situated 10 kms away from Sri Gokulam college of Nursing. It is a private organization. CSI Balar Gnana Illam is a control group setting which is situated 10 kms away from Sri Gokulam College of Nursing. It is also an private organization.

Sample:

Sample is defined as the subset of population, selected to participate in a study. **(Polit D.F & Beck Tatano Cheryl, 2008)**

The sample of the study was mild and moderate mentally challenged children with motor activity impairment.

- **Sample Size:**

  The sample size of this study was 60.

- **Sampling Technique:**

  The sampling technique adopted for this study was Purposive sampling technique.

Criteria for Sample Selection:

Inclusion criteria:

1. Children of mild and moderate mentally challenged with motor activity impairment.
2. Children of both the gender.
3. Children aged between 6-16 years.

Exclusion criteria:

1. Children already exposed to sensory integration.
2. Children who were absent at the time of data collection.
3. Children having physical illness at the time of data collection.

Variables:

- **Independent variable:** Sensory integration therapy
- **Dependent variable:** Motor activity

Description of the tool:

It consists of two sections,

Section-I: Demographic Variables.

This section consists of demographic variables like Age, gender, type of mental retardation, spent time in leisure activity, activities of daily living performed by the children, any medical illness and any other therapies received.

Section -II: Tool to assess the motor activity.

This is a structured observatory checklist, used by the investigator. It consists of 15 items. This Scale was used for mild and moderate mentally challenged children between the age group 6-16 years.

Table 3.1: Scoring procedure:

Response	Scoring
Yes	1
No	0

Add the scores of all 15 items together. The minimum score is 0, and the maximum score is 15. Higher scores indicate no impairment in motor activity.

SCORING:

0-5 **:** Severe motor impairment

6-10 **:** Moderate motor impairment

11-14 **:** Mild motor impairment

15 **:** No impairment

Validity and Reliability of the Tool

Validity:

Validity of an instrument refers to the degree to which an instrument measures what it is supposed to measure. **(Sharma Suresh K, 2012)**

The validity of the tool was obtained on the basis of opinion of 1 psychiatrist, 1 clinical psychologist, 1 occupational therapist and 5 nursing experts in the field of psychiatric nursing. The tool was found adequate and minor suggestions given by the experts were incorporated.

Reliability:

Reliability is the degree of consistency and accuracy with which an instrument measures the attribute for which it is designed to measure. **(Sharma Suresh K, 2012)**

The reliability of the tool was checked and established by using inter-rater method and the obtained score was r = 0.9 shows that the tool was highly reliable and it was considered for proceeding.

Pilot Study

After obtaining the formal permission from the Manager of the SIMEC and MMIC special school, Salem the pilot study was conducted from 24.07.2014 to 30.07.2014 among six study subjects. Pretest was conducted on 24.07.2014 with the help of structured observatory checklist. Then the Sensory integration therapy was given to the samples on the same day and the post test was conducted on 30.07.2014 with the same tool.

The findings of the pilot study revealed that it was feasible to conduct the main study.

Method of Sample Selection

The investigator got permission for 2 Special schools in Salem namely Adharsh Thai special school and CSI Balar Gnana Illam. Adharsh Thai special school was selected for experimental group and CSI Balar Gnana Illam was selected for Control group.

Non probability purposive sampling technique was done to select 30 subjects. In experimental group, the total population was 40 children. The investigator with the help of the structured observatory checklist made the assessment of 40 children to find out the motor activity impairment. Among them 30 were found to have motor activity impairment and fulfilled the sampling criteria and they were selected as study samples. In control group, the total population was 40 in which 30 children were mild and moderate mentally challenged. The investigator made the assessment of 30 children with the help of structured observatory checklist. All the 30 were found to have motor activity impairment and they were selected as study samples.

Method of Data Collection

Ethical consideration:

Written permission was obtained from the correspondents of Adarsh Thai special school and CSI Balar Gnana Illam, Salem to conduct the study.

Period of data collection:

The data was collected for a period of 4 weeks (04.09.2014-02.10.2014).

Data collection procedure

The study was conducted in Adarsh Thai special school(Experimental group) and CSI Balar Gnana Illam (Control group),Salem. The samples were selected by Non-Probability purposive sampling technique. Pre test was conducted from 04.09.2014 to 06.09.2014 by using structured observatory checklist. Selection of samples was carried out by purposive sampling technique. Samples were segregated in to two groups as experimental group (n=30) and control group(n=30).

Sensory integration therapy was carried out by integrating senses such as touch, hearing and vision. Sensory integration was given under three stages:

Stage-1:

Warm up:

In which the child clothing was loosened and shoes were removed.

Stage-2:

Performance phase:

In which the activities were given as follows.

For 1- 6 days, (08.09.2014 to 13.09.2014)

a) Reaching the objects was carried out. In this the child was asked to crawl and reach the object placed at a distance of 5feet,take the object with his thumb and index finger, walks and sit in a chair placed near by.

Day 7-11, (14.09.2014 to 18.09.2014)

b) Hand and eye co-ordination was introduced. In this the child was asked to catch the ball and throw it back.

Next 12-16 days, (19.09.2014 to 24.09.2014)

c) The activity jumping and clapping were carried out. The child was asked to jump with both feet and the clapped the hands.

Day 17-21, (25.09.2014 to 30.09.2014)

d) The activity of placing the ring was carried out. The child was asked to place the rings one over the other.

Stage-3:

Wind down:

The children were made to sit and take deep breathing for relaxation

This was carried out 30 minutes a day by 6 groups consisting of 5 children in each for 21 consecutive days. Followed with 21 days of practice of the sensory integration therapy, post test was conducted between 1.10.2014 and 02.10.2014 both in experimental and control group respectively.

Plan for Data Analysis

The data analysis will be done using descriptive and inferential statistics.

- Demographic data will be calculated by using frequency and percentage
- The effectiveness of sensory integration therapy on motor activity will be calculated using inferential statistics. (paired 't' test)
- Association between the pre test score of motor activity and demographic variables will be calculated by using inferential statistics (chi- square analysis)

Summary

This chapter dealt with the methodology of the study. It consists of research approach, research design, population, setting, sampling, variables, description of the tool, validity and reliability, pilot study, method of data collection and plan for data analysis.

CHAPTER -IV

DATA ANALYSIS AND INTERPRETATION

Research data must be processed and analysed in an orderly fashion so that patterns and relationship can be discerned, validated and hypotheses can be tested. Quantitative data analyzed through statistical analysis includes simple procedures as well as complex and sophisticated methods. (**Polit, 2004**)

This chapter deals with analysis and interpretation of the data collected to evaluate the Effectiveness of Sensory integration therapy on motor activity among mentally challenged children at selected special schools, Salem. The collected data were tabulated, organized and analyzed by using both descriptive and inferential statistics.

The findings are presented under the following sections

Section-A:

Distribution of mentally challenged children according to their selected demographic variables in experimental and control group.

Section-B:

Distribution of pre-test level of motor activity among mentally challenged children in experimental group and control group.

Section-C:

a) Distribution of post test level of motor activity among mentally challenged children in experimental group and control group.
b) Comparison of pretest and posttest level of motor activity among mentally challenged children in experimental and control group.

c) Mean, standard deviation and mean difference according to the pretest and posttest level of motor activity among mentally challenged children in experimental and control group.

Section-D: Hypotheses testing

- Effectiveness of Sensory integration therapy on motor activity among mentally challenged children in Experimental Group.
- Effectiveness of Sensory integration therapy on motor activity among mentally challenged children in Experimental and Control Group.
- Association between the pre test level of motor activity among mentally challenged children and their selected demographic variables in experimental and control group.

Section-A

Distribution of mentally challenged children according to their Selected Demographic Variables in Experimental and Control Group.

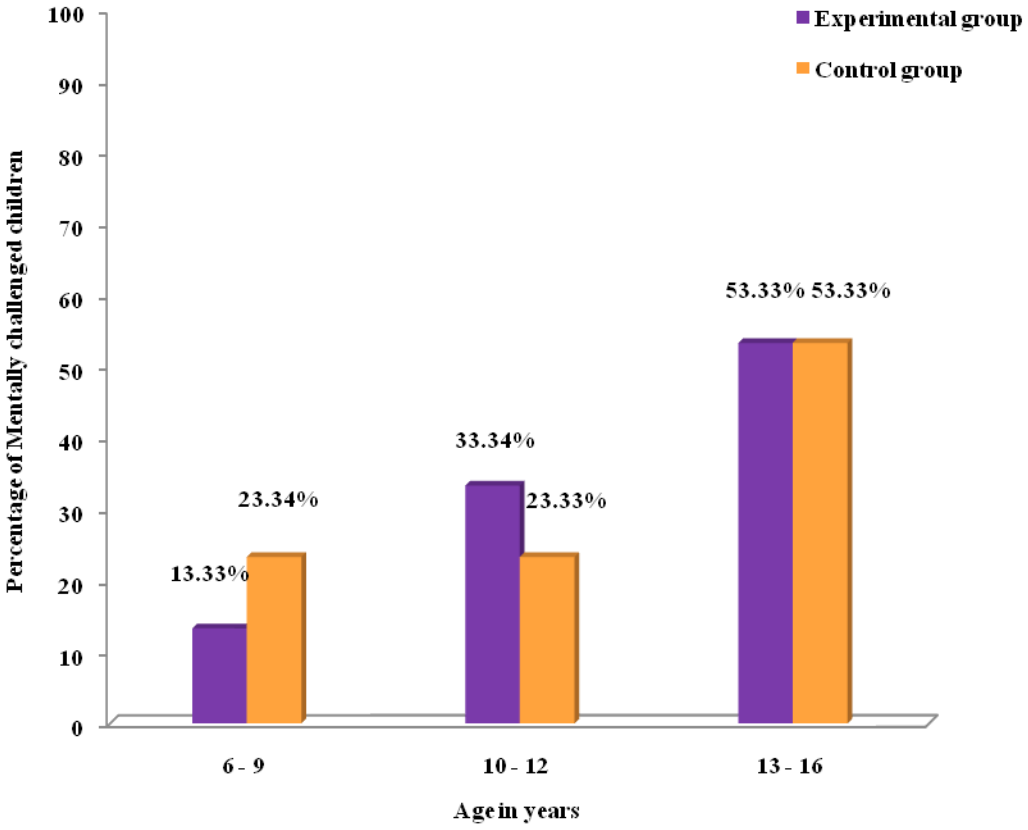

Fig- 4.1: Percentage distribution of mentally challenged children according to their age.

The above figure shows, that in experimental group, 16(53.33%) of mentally challenged children belongs to 13-16 years of age, 10(33.34%) of them belongs to 10-12 years of age and 4(13.33%) of them belongs to 6-9 years of age. In control group, 16(53.33%) of them belongs to 13-16 years of age, 7(23.34%) of them belongs to 10-12 years of age and 7(23.33%) of them belongs to 6-9 years of age.

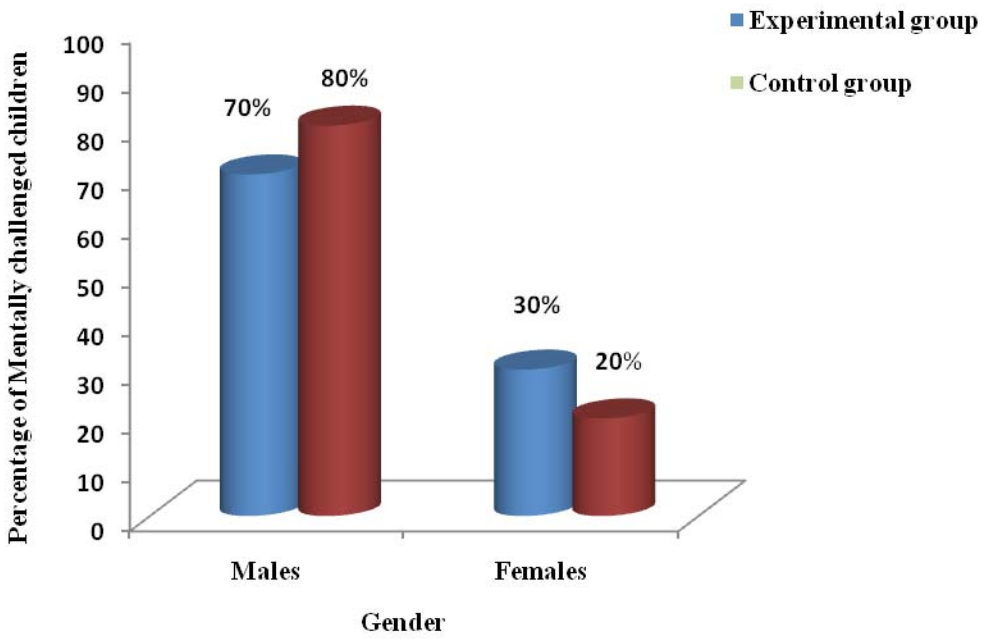

Fig-4.2: Percentage distribution of mentally challenged children according to the gender.

The above figure shows that, in experimental group most of the mentally challenged children i.e. 21(70%) are males and remaining 9(30%) are females. In control group, most of the samples i.e. 24(80%) are males and 6(20%) are females.

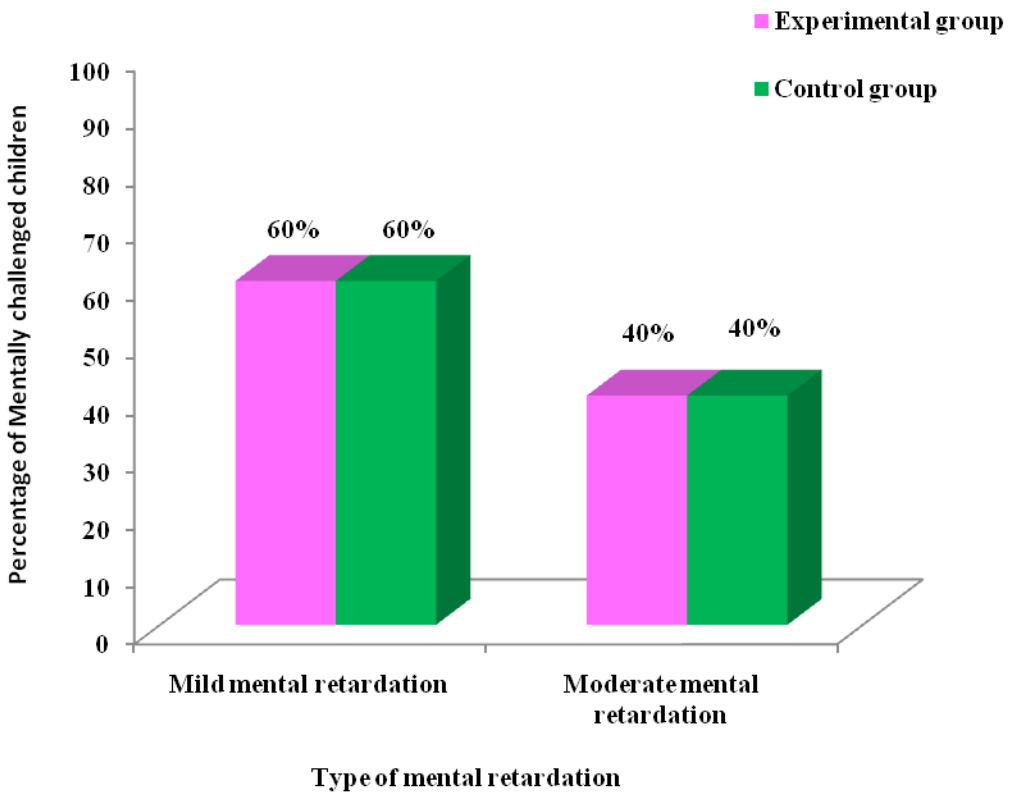

Fig-4.3: Percentage distribution of mentally challenged children according to the type of mental retardation

The above figure shows that, both in experimental and control group majority of mentally challenged children i.e.18(60%) have mild mental retardation and others 12(40%) have moderate mental retardation.

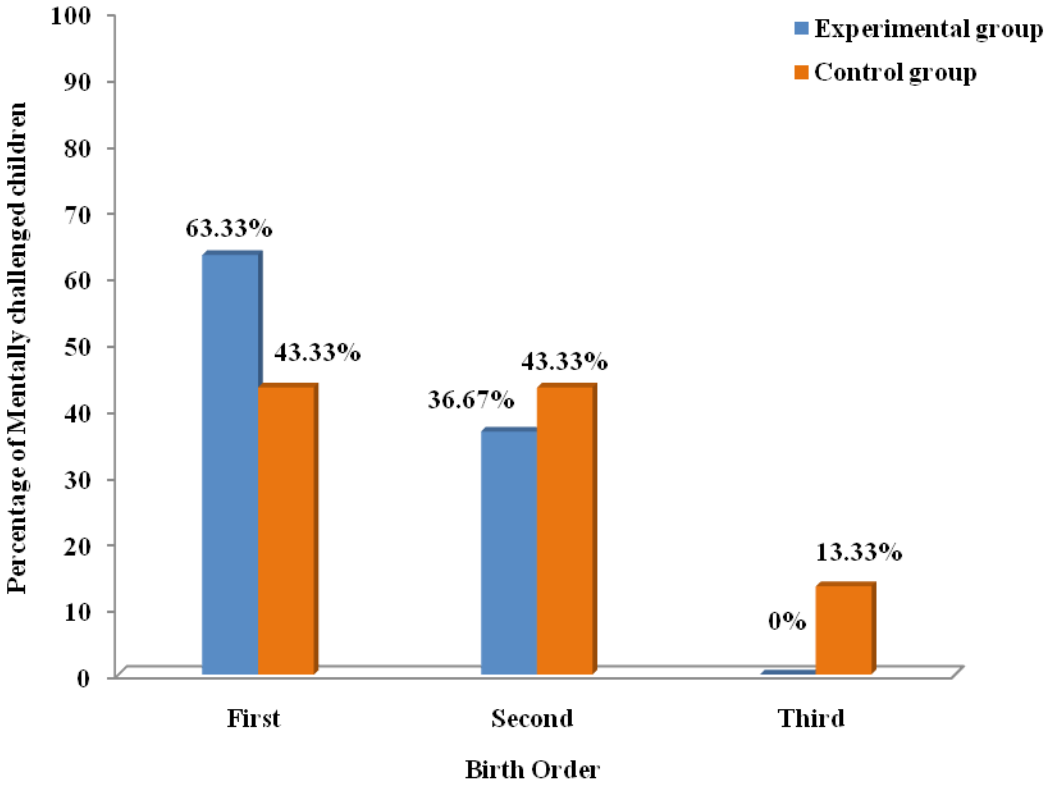

Fig-4.4: Percentage distribution of mentally challenged children according to their Birth order.

The above figure shows that, in experimental group 19(63.33%) of the mentally challenged children are in first birth order, 11(36.67%) are in second birth order and none of them are in third birth order. In control group, 13(43.33%) are in first birth order, 13(43.33%) are in second birth order and 4(13.37%) are in third birth order.

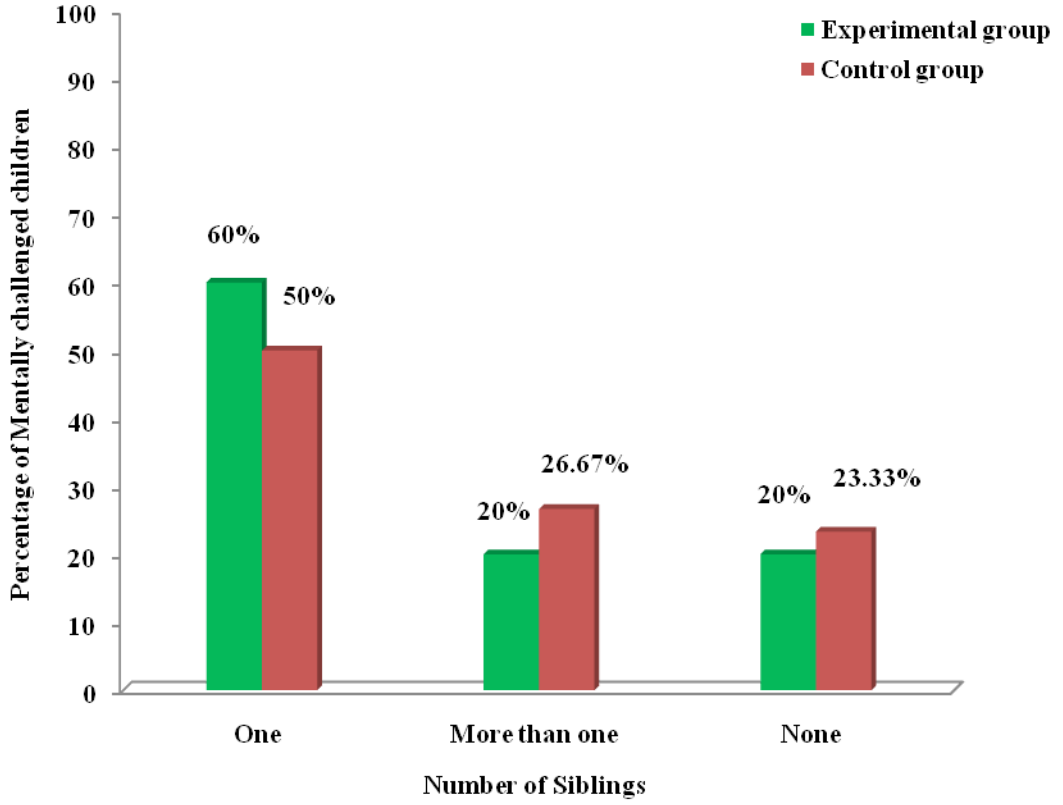

Fig-4.5: Percentage distribution of mentally challenged children according to No. of. siblings.

The above figure shows that, in experimental group most of the mentally challenged children i.e.18(60%) have one sibling, 6(20%) have more than one sibling and 6(20%) have no siblings. In control group, 15(50%) have one sibling, 8(26.67%) have more than one sibling and 7(23.33%) have no siblings.

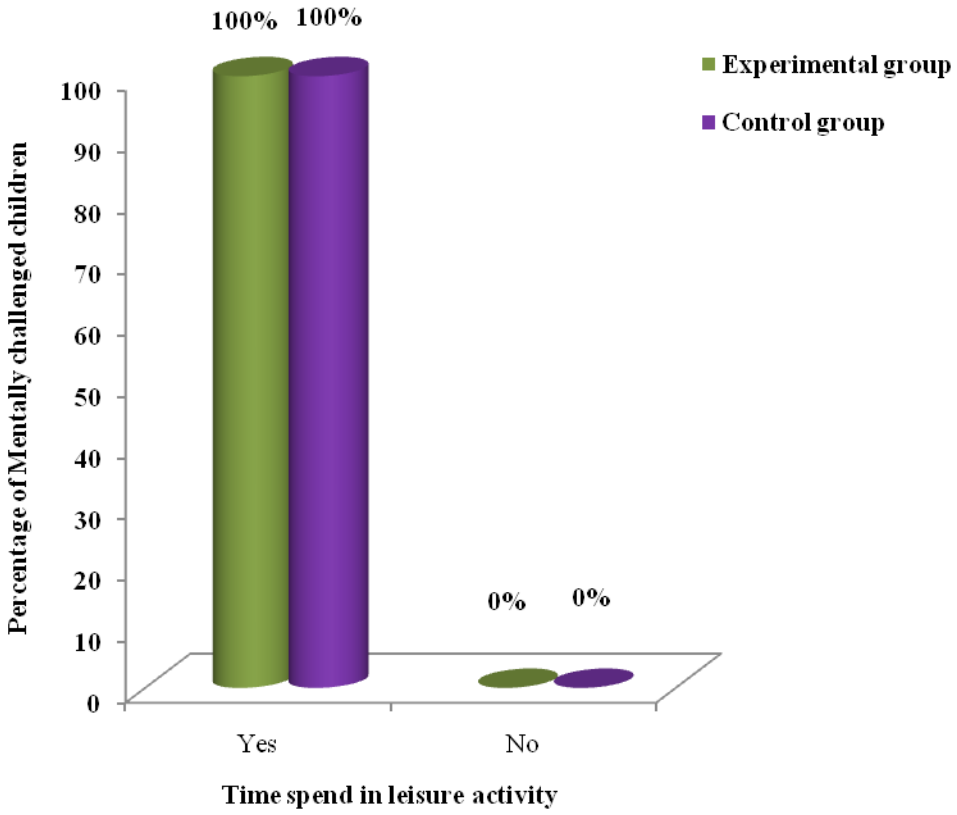

Fig-4.6: Percentage distributions of mentally challenged children according to time spend in leisure activity.

The above figure shows that, both in experimental group and control group all the mentally challenged children 30(100%) of them are spending time in leisure activity.

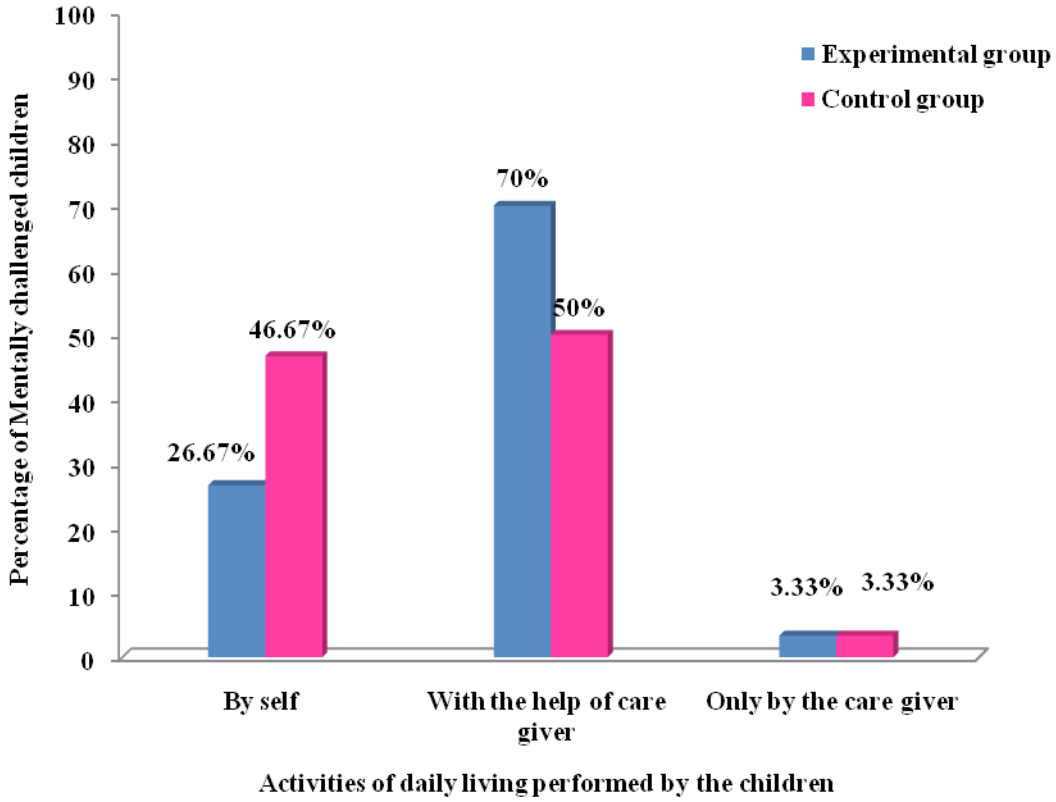

Fig-4.7: Percentage distribution of mentally challenged children according to activities of daily living performed by the children.

The above figure shows that, in experimental group most of the mentally challenged children i.e.21(70%) are performing their activities of daily living with the help of care giver, 8(26.67%) are performing by self and remaining 1(3.33%) sample activities of daily living is performed only by care giver. In control group most of the mentally challenged children i.e. 15(50%) are performing their activities of daily living with the help of care giver,14(46.67%) are performing by self and remaining 1(3.33%) sample activities of daily living is performed only by care giver.

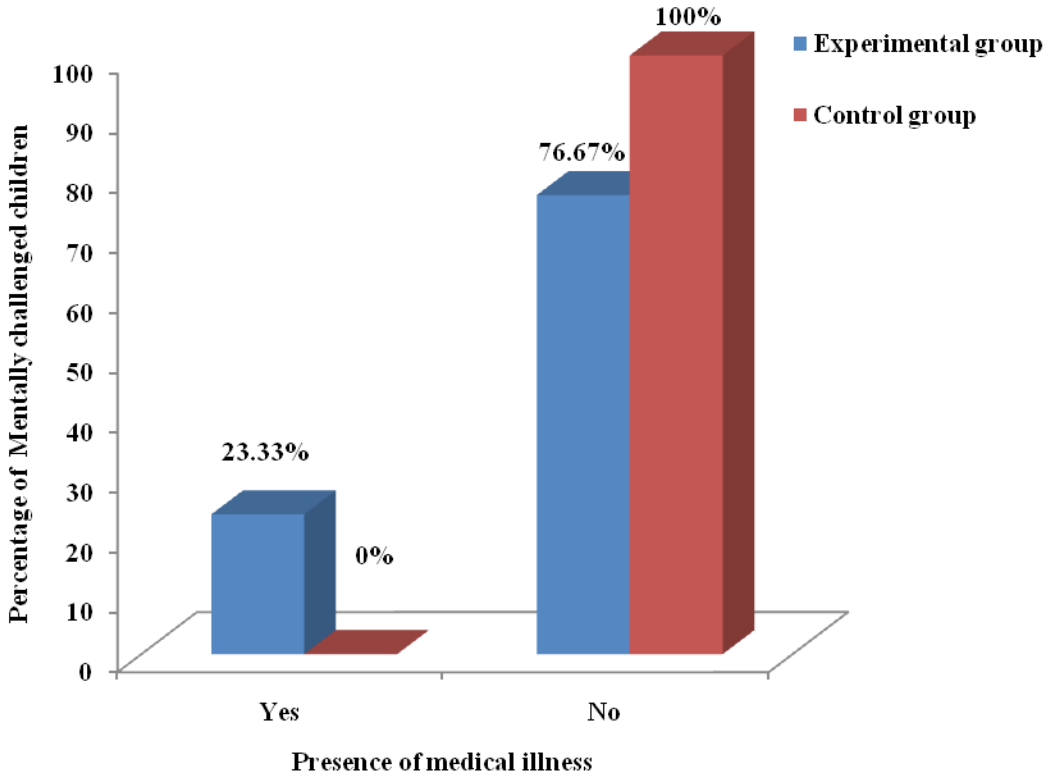

Fig-4.8: Percentage distribution of mentally challenged children according to presence of medical illness.

The above figure shows that, in experimental group only 7(23.33%) mentally challenged children have medical illness and 23(76.67%) of them have no medical illness. In control group, none of them have medical illness.

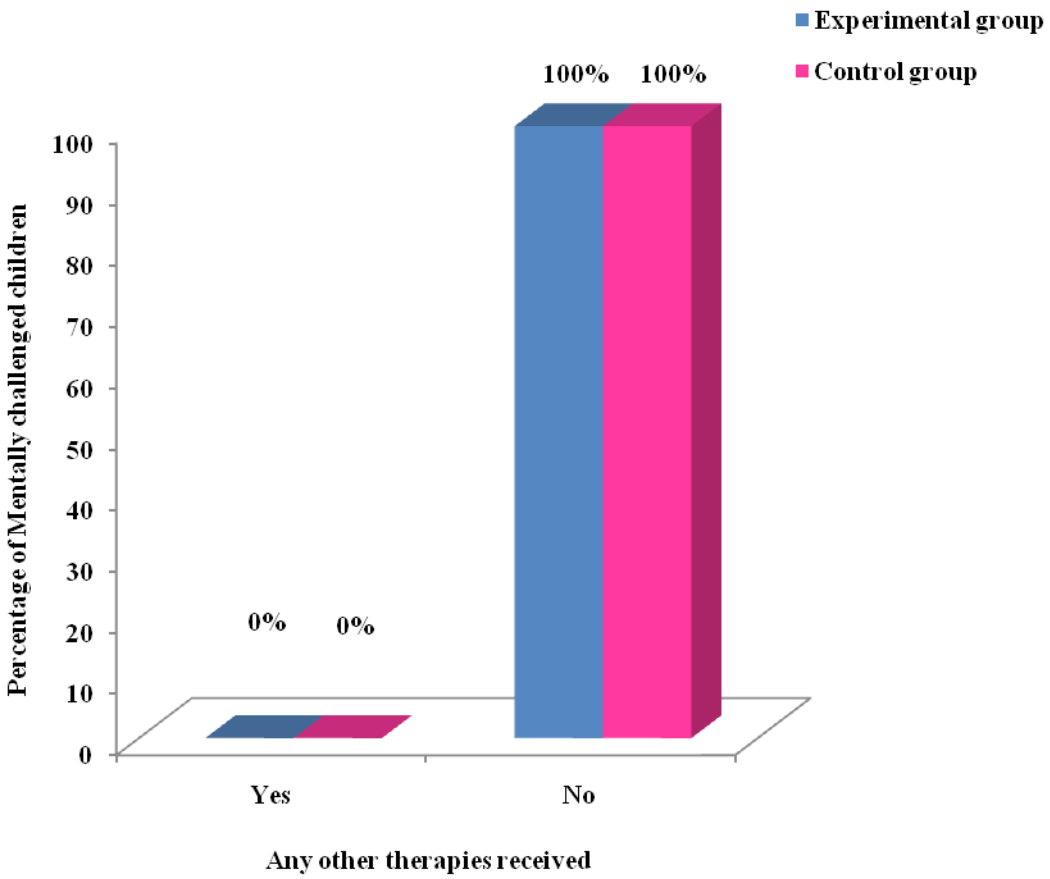

Fig-4.9: Percentage distribution of mentally challenged children according to other therapies received.

The above figure shows that, both in experimental and control group all the mentally challenged children 30(100%) have not received any other therapies

Section-B

Distribution of pretest level of motor activity among mentally challenged children in Experimental and control group.

Table 4.1:

Frequency and percentage distribution of mentally challenged children according to their pretest scores on level of motor activity among Experimental and control group.

n=60

Level of motor activity	Pre test			
	Experimental group n = 30		Control group n = 30	
	f	%	f	%
No impairment	0	0	0	0
Mild motor impairment	9	30	5	16.67
Moderate motor impairment	16	53.33	19	63.33
Severe motor impairment	5	16.67	6	20

The above table shows during pretest, in experimental group, 9(30%) have mild motor impairment, 16(53.33%) have moderate motor impairment and 5(16.67) have severe motor impairment. In control group, 5(16.67%) have mild motor impairment, 19(63.33%) have moderate motor impairment and 6(20%) have severe motor impairment.

Section-C

a) Distribution of posttest level of motor activity among mentally challenged children in experimental and control group.

Table-4.2:

Frequency and Percentage distribution of mentally challenged children according to their post test scores on level of motor activity in Experimental and control group.

n=60

Level of Motor activity	Post test			
	Experimental group n = 30		Control group n = 30	
	f	%	f	%
No impairment	3	10	0	0
Mild motor impairment	11	36.67	5	16.67
Moderate motor impairment	11	36.67	19	63.33
Severe motor impairment	5	16.67	6	20

The above table shows during posttest, in experimental group 3(10%) have no impairment, 11(36.67%) have mild motor impairment, 11(36.67%) have moderate motor impairment and 5(16.67%) have severe motor impairment. In control group, 5(16.67%) have mild motor impairment, 19(63.33%) have moderate motor impairment and 6(20%) have severe motor impairment.

b) Comparison of pretest and posttest level of motor activity among mentally challenged children in experimental and control group.

Table-4.3:

Percentage distribution of mentally challenged children according to their Level of motor activity.

n=60

Level of Motor activity	Pre test				Post test			
	Experimental group		Control group		Experimental group		Control group	
	f	%	f	%	f	%	f	%
No impairment	0	0	0	0	3	10	0	0
Mild motor impairment	9	30	5	16.67	11	36.67	5	16.67
Moderate motor impairment	16	53.33	19	63.33	11	36.67	19	63.33
Severe motor impairment	5	16.67	6	20	5	16.67	6	20

During pretest, in experimental group, majority of mentally challenged children 16(53.33%) have moderate motor impairment, 9(30%) have mild motor impairment, and 5(16.67%) have severe motor impairment. In control group, 19(63.33%) have moderate motor impairment, 5(16.67%) have mild motor impairment and 5(16.67%) have severe motor impairment.

During posttest, in experimental group 3(10%) have no impairment, 11(36.67%) of them have mild motor impairment,11(36.67%) have moderate motor impairment and 5(16.67%) have severe motor impairment. In control group, 5(16.67%) have mild motor impairment,19(63.33%) have moderate motor impairment and 6(20%) have severe motor impairment.

c) Mean, SD, Mean percentage and differences in mean percentage according to the pre test and post test scores level of motor activity among mentally challenged children in experimental and control group.

Table 4.4:

Mean, SD, Mean percentage and differences in mean percentage according to the pre test and post test scores level of motor activity among mentally challenged children in experimental and control group.

n=60

Group	Pre test			Post test			Mean Difference
	Mean	SD	Mean %	Mean	SD	Mean %	
Experimental Group	6.4	4.32	42.67	8.6	3.89	57.33	2.2
Control group	7.5	2.89	50	7.63	2.95	50.85	0.05

The table shows that in experimental group in pre test the mean score is 6.4±4.32 which is 42.67% and post score mean score is 8.6±3.89 which is 57.33% with mean difference of 2.2.

In control group during the pre test the mean score is 7.5±2.89 which is 50% and post score mean score is 7.63±2.95 which is 50.85% with mean difference of 0.05.

Section – D

Hypothesis Testing

a) Effectiveness of Sensory integration therapy on the level of motor activity among mentally challenged children at selected special school in Experimental Group.

Table- 4.5:

Mean, SD, Mean Difference and paired-'t' value on level of motor activity among mentally challenged children at selected special school in experimental group before and after Intervention.

n=30

S. No	Experimental Group	Mean	SD	Mean difference	df	't' value
1.	Pre test	6.4	4.32	2.2	29	5.60*
2.	Post test	8.6	3.89			

Table value t=2.05, * Significant at p ≤ 0.05 level.

Table - 4.3.1 represents, the mean score on level of motor activity among mentally challenged children in experimental group before the intervention is 6.4±4.32 and after intervention was 8.6 ± 3.89 with a mean difference of 2.2. The estimated paired-'t' value 5.60 is most significantly higher than the table value of 2.05 at P≤ 0.05 level. It shows that the sensory integration therapy is effective in improving the level of motor activity among mentally challenged children. Hence the research hypothesis (H_1) is retained at P≤ 0.05 level.

b) Effectiveness of Sensory integration therapy on the level of motor activity among mentally challenged children in Experimental Group and control group.

Table-4.6:

Mean, SD, Mean Difference and independent-'t' value on level of motor activity among mentally challenged children in experimental group and control group.

n=60

S. No	Group	Mean	SD	Mean difference	df	't' value
1.	Experimental group	8.60	3.89	0.97	58	4.44*
2.	Control group	7.63	2.95			

Table value t = 2.75, * Significant at p ≤ 0.01 level.

Table-4.5 represents, the mean post test score on level of motor activity among mentally challenged children in experimental group is 8.6±3.89 and in control group is 7.63±2.95 with a mean difference of 0.97. The estimated independent 't' value 4.44 is most significantly higher than the table value 2.75 at P≤0.01 level. It shows that there is significant difference in the level of motor activity among mentally challenged children between experimental and control group. Hence the research hypothesis (H_2) is retained at P≤0.01 level.

c) Association between the motor activity and their Selected Demographic Variables in Experimental and Control Group

Table-4.7:

Chi-square test on the pre test level of motor activity among mentally challenged children and their Demographic Variables in experimental group.

n=30

S. No	Demographic Variables	Experimental Group		
		df	χ^2	Table Value
1.	Age	6	15.34*	12.59
2.	Gender	3	1.08	7.82
3.	Type of mental retardation	3	2.95	7.82
4.	Birth order	6	6.43	12.59
5.	No. of. Siblings	6	6.48	12.59
6.	Time spend in leisure activity	3	0	7.82
7.	Activities of daily living performed by the children	6	6.49	12.59
8.	Presence of any medical illness	3	0.46	7.82
9.	Any other therapies received, if yes specify	3	0	7.82

***Significant at p ≤ 0.05 level.**

The above table reveals that, there is significant association between the level of motor activity among mentally challenged children and their age in experimental group. Hence hypothesis H_3 is retained for the above mentioned demographic variables at p≤0.05 level.

Table-4.8:

Chi-square test on the pre test level of motor activity among mentally challenged children and their Demographic Variables in control group.

n=30

S.No	Demographic Variables	Control Group		
		df	χ^2	Table Value
1.	Age	6	5.74	12.59
2.	Gender	3	0.09	7.82
3.	Type of mental retardation	3	1.12	7.82

4.	Birth order	6	5.39	12.59
5.	No. of. Siblings	6	3.64	12.59
6.	Time spend in leisure activity	3	0	7.82
7.	Activities of daily living performed by the children	6	6.56	12.59
8.	Presence of any medical illness	3	0	7.82
9.	Any other therapies received, if yes specify	3	0	7.82

***Significant at p ≤ 0.05 level.**

The above table reveals that, there is no significant association between the level of motor activity among mentally challenged children and their demographic variables in control group. Hence hypothesis H_3 is rejected for the above mentioned demographic variables at $p \leq 0.05$ level .

Summary

This chapter dealt with the data analysis and interpretation in the form of statistical values based on the objectives. Paired and Independent 't' test was used to evaluate the effectiveness of sensory integration therapy on level of motor activity. Chi square test was used to find out the association between the sensory integration therapy on level of motor activity among mentally challenged children and their demographic variables.

CHAPTER - V

DISCUSSION

The present study was conducted to evaluate the effectiveness of sensory integration therapy on motor activity among mentally challenged children .Quasi experimental (pretest post test with control group) design was adopted. The mentally challenged children were selected by using purposive sampling technique. The study comprised of 60 mentally challenged children and the data was collected from them with the help of structured observatory checklist on motor activity.

Distribution of mentally challenged children according to their demographic variables.

In experimental group, majority of samples 16(53.33%) were belongs to 13-16 years of age,21(70%) were males, 18(60%)had mild mental retardation, 19(63.33%) were in first birth order ,18(60%) had one sibling, all 30(100%)were spending time in leisure activity, 21(70%)were performing activities of daily living with the help of care giver,7(23.33%)had no medical illness, all 30(100%) does not receive any other therapies.

In control group, 16(53.33%) samples belongs to 13-16 years of age,24(80%) were males, 18(60%)had mild mental retardation, 13(43.33%) were both in first and second birth order ,15(50%) had one sibling, all 30(100%)were spending time in leisure activity, 15(50%)were performing activities of daily living with the help of care giver, all 30(100%)had no medical illness,30(100%) does not receive any other therapies.

The present study was supported by **Maxwell AL.M, (2009),** conducted a descriptive study on motor activity among mentally challenged children. He

concluded that among mentally challenged children, 75-80% of them have mild and moderate mental retardation and among them 68% of them were males and 80% of them have physical illness.

The first objective of the study was to assess the level of motor activity before and after administering sensory integration therapy among mentally challenged children.

During pretest, in experimental group, 9(30%) samples had mild motor impairment, 16(53.33%) had moderate motor impairment and 5(16.67%) had severe motor impairment. In control group, 5(16.67%) had mild motor impairment, 19(63.33%) had moderate motor impairment and 5(16.67%) had severe motor impairment.

During posttest, in experimental group 3(10%) had no impairment, 11(36.67%) of them had mild motor impairment, 11(36.67%) had moderate motor impairment and 5(16.67%) had severe motor impairment. In control group, 5(16.67%) had mild motor impairment,19(63.33%) had moderate motor impairment and 6(20%) had severe motor impairment.

The present study was supported by **Sree Vathsav, (2011)** conducted a survey to assess the motor activity among moderate mentally challenged children. The findings indicated that 65(32.5%) samples had mild motor impairment, 115(57.5 %) had moderate motor impairment and 20(10%) had severe motor impairment.

So it indicates that the level of motor activity is varied according to the type of mental retardation.

The second objective of the study was to assess the effectiveness of sensory integration therapy on motor activity among mentally challenged children.

In pretest, the mean score of motor activity was 6.4±4.32,where as in post test, the mean score of motor activity was 8.6±3.89.The calculated 't' value was 5.60 which is greater than the table value of 2.05 at $p<0.05$ level which shows that the sensory integration therapy was effective in improving the level of motor activity. Hence hypothesis H_1 was retained.

This study was supported by **Johnson CM, (2011)** conducted a study on motor activity by giving sensory integration therapy on 20 mentally challenged children in a residential home, Mangalore. The pretest mean score was 24.35±2.4 and the post test mean score was 28.4±2.7. The 't' value was 4.96 which was highly significant at $p<0.05$ level.

This study supports that sensory integration therapy is an effective method to improve the level of motor activity among mentally challenged children.

The third objective of the study was to associate the level of motor activity among mentally challenged children with their selected demographic variables.

There was significant association between the level of motor activity among mentally challenged children and their age in experimental group and there was no significant association between the level of motor activity among mentally challenged children in control group at $p\leq0.05$ level. Hence hypothesis H_3 was retained for the above mentioned demographic variable in experimental group and hypothesis H_3 was rejected in control group.

The present study was supported by **Dawsan.S.A, (2010),** conducted a study to assess the motor activity among mentally challenged children in a special school, Newham. Result showed that there was no significant association between motor activity of the children with their selected demographic variables except age of the

mentally challenged children both in experimental group and control group at $p \leq 0.05$ level.

Hence the present study states that there was a significant association between the age and the level of motor activity. So it could be interpreted that the age is the factor which affects the level of motor activity among mentally challenged children.

Summary

This chapter dealt with the discussion of the study with the objectives.

CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATIONS, LIMITATIONS AND RECOMMENDATIONS

In this chapter the summary, conclusion, implications, limitations of the study and recommendations for further research are presented.

Summary

The main focus of the study was to evaluate the effectiveness of sensory integration therapy on motor activity among mentally challenged children at selected special schools, Salem. Quantitative approach with quasi experimental (pretest post test with control group) design was used for the study. The conceptual frame work for the study was based on Modified Weidenbach's Helping art of Clinical Nursing theory. The tool used in this study consists of two sections. Those are demographic variables of mentally challenged children and structured observatory checklist on motor activity. Purposive sampling technique was used to select the samples and data was collected from 60 mild and moderate mentally challenged children of special schools, Salem, Tamil Nadu.

The collected data were analyzed by using descriptive and inferential statistics. To test the hypothesis paired 't' test, independent 't' test and chi square test were used. The level of significance $p<0.05$ was used to test the hypothesis.

Major Findings of the Study

- During pretest, in experimental group, 16(53.33%) had moderate motor impairment. In control group, 19(63.33%) had moderate motor impairment.
- During posttest, in experimental group, 11(36.67%) of them had mild motor impairment, 11(36.67%) had moderate motor impairment. In control group, 19(63.33%) had moderate motor impairment .

- In pretest, the mean score of motor activity was 6.4±4.32,where as in post test, the mean score of motor activity was 8.6±3.89.The calculated 't' value was 5.60 which is greater than the table value of 2.05 at $p<0.05$ level which shows that the sensory integration therapy was effective in improving the level of motor activity. Hence hypothesis $_{H1}$ was retained.
- There was significant association ($p\leq0.05$ level) between the level of motor activity among mentally challenged children and their age in experimental group. Hence hypothesis H_3 was retained for above mentioned demographic variables.
- There was no significant association between the level of motor activity among mentally challenged children and their demographic variable in control group $p\leq0.05$ level. Hence hypothesis H_3 was rejected for the above mentioned demographic variable.

Conclusion

A study was conducted to assess the effectiveness of sensory integration therapy on motor activity among mentally challenged children at selected special schools, Salem. During pre test most of the children had moderate motor impairment and few children had mild motor impairment and very few had severe motor impairment. After the implementation of sensory integration therapy majority of the children had mild motor impairment and few had no motor impairment at all. This shows that Sensory integration Therapy was effective in improving the level of motor activity of mentally challenged children.

Implications

The findings of the study have implicated in different branches of nursing practice, nursing education, nursing research and nursing administration.

Nursing Practice:

- The nurses working in the health care services can train the mentally challenged children on motor activity using Sensory integration Therapy.
- The nurses can teach the care givers of mentally challenged children about the Sensory integration Therapy on motor activity in the hospital and community through demonstration.
- Self instructional module on Sensory integration therapy to improve motor activity can be distributed to the care givers of mentally challenged children. It can be in the form of printed materials with pictures or CD consisting of Video clippings regarding training mentally challenged children.

Nursing Education:

- Educational training on sensory integration therapy can be given for nursing students.
- Conferences, workshops and seminars can be held for nursing students to impart knowledge about training the mentally challenged children on motor activity.
- Nursing curriculum has to focus on enabling the nursing students to adopt different teaching strategies like demonstration, lecture cum discussion about the methods of training the mentally challenged children on motor activity.
- Continuing nursing education programme can be conducted to teachers on sensory integration therapy.

Nursing Administration:

- Necessary administrative support should be provided to conduct programs on training the mentally challenged children and care givers about improving motor activity.

- The nurse administrator can organize conferences, workshop and seminars for nurses working in the hospital.
- Nurse administrators should make arrangements to see that sufficient manpower, money and material are available for these education programmes.
- In service education programme can be organized regarding the effectiveness of sensory integration on level of motor activity for staff nurses.

Nursing Research:

- The study will be a valuable reference material for further researchers.
- Adequate allocation, funds and training should be provided to the nurses for conducting research.
- The methodology and findings of the study helps the nurse researcher to explore the concept of sensory integration therapy to care givers and apply this method in other activities.

Recommendations

Recommendations for further research,

- A comparative study can be done between different therapies like sensory integration therapy and sensory stimulation therapy.
- A similar study can be applied for children with other developmental delays like autism, cerebral palsy etc.
- A similar study can be undertaken without a control group.
- A comparative study can be conducted between the Residents and Non-residents children.
- A similar study can be conducted with large number of samples.
- A similar study can be conducted for severe mentally retarded children.
- The study can be carried out for a longer period of time.

Summary

This chapter dealt with summary conclusion, implications, and limitations and recommendations for further research.

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ANNEXURE - A

LETTER SEEKING PERMISSION TO CONDUCT A RESEARCH STUDY

From

Ms. Pricy Monica .M,

II Year M.Sc., (N),

Sri Gokulam College of Nursing,

Salem, Tamil Nadu.

To

The Principal,

Sri Gokulam College of Nursing,

Salem, Tamil Nadu.

Respected Sir/Madam,

Sub: Permission to conduct research project - request- reg.

I, **Ms.Pricy Monica.M** II Year M.Sc., (Nursing) student of Sri Gokulam College of Nursing, is conducting a research project in partial fulfillment of "The Tamil Nadu Dr. M.G.R. Medical University, Chennai" as a part of the requirement for the award of M.Sc. (Nursing) Degree.

Topic: "A Study to evaluate the Effectiveness of Sensory integration therapy on motor activity among Mentally challenged children at selected special school, Salem".

I wish to seek the administrative permission to conduct the research study at Adarsh Thai Special school and CSI Balar Gnana Illam , Salem.

Kindly do the needful.

Thanking you.

Date : 20.07.2014 Yours sincerely,

Place : Salem

(Ms.PricyMonica.M)

ANNEXURE - B

LETTER GRANTING PERMISSION TO CONDUCT A RESEARCH STUDY

SRI GOKULAM COLLEGE OF NURSING
3/836, Periyakalam, Neikkarapatti, Salem - 636 010.
Phone : 0427 - 6544550,2272240,2272250 Fax : 0427 - 2270200, 2447077
Email : sgcon2001@yahoo.com, sgcon2001@gmail.com

Date : .....

03.09.2014

LETTER REQUESTING PERMISSION TO CONDUCT A

RESEARCH STUDY

To

The Correspondent,

Adharsh Thai Special School,

Salem, Tamil Nadu.

Respected Sir/Madam,

Sub: Permission to conduct Research Project - Request- Reg.

This is to introduce **Ms.PricyMonica.M,** Final Year M.Sc. (Nursing) student of Sri Gokulam College of Nursing. She is to conduct a research project which is to be submitted to **"The Tamil Nadu Dr. M.G.R. Medical University, Chennai"** as partial fulfillment of university requirement for the award of M.Sc. (Nursing) Degree.

Topic: "A Study to evaluate the Effectiveness of Sensory integration therapy on motor activity among mentally challenged children at selected special school, Salem".

I request you to kindly permit her to conduct the research study in your esteemed Institution. She will adhere to the policies and regulations of the Institution.

Thanking you,

Date : 03.09.2014

Place : Salem

Yours Sincerely,

(Dr.K.Tamizharasi)
PRINCIPAL
Sri Gokulam College of Nursi
SALEM – 636 010.

Permission Granted
For ADHARSH THAI SPECIAL SCHOOL
Principal

SRI GOKULAM COLLEGE OF NURSING
3/836, Periyakalam, Neikkarapatti, Salem - 636 010.
Phone : 0427 - 6544550,2272240,2272250 Fax : 0427 - 2270200, 2447077
Email : sgcon2001@yahoo.com, sgcon2001@gmail.com

Date : .....

LETTER REQUESTING PERMISSION TO CONDUCT A

RESEARCH STUDY

To

The Correspondent,

CSI balar gnana illam,

Salem, Tamil Nadu.

Respected Sir/Madam,

Sub: Permission to conduct research project - request- reg.

This is to introduce **Ms.PricyMonica.M,** Final Year M.Sc. (Nursing) student of Sri Gokulam College of Nursing. She is to conduct a research project which is to be submitted to **"The Tamil Nadu Dr. M.G.R. Medical University, Chennai"** as partial fulfillment of university requirement for the award of M.Sc. (Nursing) Degree.

Topic: "A Study to evaluate the Effectiveness of Sensory integration therapy on motor activity among mentally challenged children at selected special school, Salem".

I request you to kindly permit her to conduct the research study in your esteemed Institution. She will adhere to the policies and regulations of the Institution.

Thanking you,

Date :

Place : Salem

Yours Sincerely,

(Dr.K.Tamizharasi)
PRINCIPAL
Sri Gokulam College of Nursing
SALEM – 636 010.

Permitted
for MANAGER,
CSI BALAR GNANA ILLAM,
SALEM - 636 007

ANNEXURE C

LETTER REQUESTING OPINION AND SUGGESTIONS OF EXPERTS FOR CONTENT VALIDITTY OF THE RESEARCH TOOL

From

Ms. Pricy Monica .M,

II Year M.Sc., (N),

Sri Gokulam College of Nursing,

Salem, Tamil Nadu.

To

(Through proper channel)

Respected Sir/Madam,

Sub: Requesting opinion and suggestions of experts for establishing content validity of the tool.

I, **Ms.Pricy Monica.M**, final year M.Sc.(Nursing) student of Sri Gokulam college of Nursing, Salem, have selected the below mentioned statement of the problem for the research study to be submitted to The Tamilnadu Dr.M.G.R.Medical University, Chennai as partial fulfilment for the award of Master of Science in Nursing.

Topic: "A Study to evaluate the Effectiveness of Sensory integration therapy on motor activity among mentally challenged children at selected special school, Salem".

I request you to kindly validate the tools developed for the study and give your expert opinion and suggestions for necessary modifications.

Thanking you.

Date : Yours sincerely,

Place : Salem

(Ms.Pricy Monica.M)

Enclosed:

1. Certificate of validation
2. Criteria checklist for evaluation of tool
3. Tool for collection of data
4. Intervention

ANNEXURE - D

TOOL FOR DATA COLLECTION

SECTION-A: DEMOGRAPHIC VARIABLES

INSTRUCTION:

The investigator collects the information through the records maintained in the institution. This information will be kept confidential.

SAMPLE NO: _____

1. Age (in years)

   a) 6-9
   b) 9-12
   c) 12-16 …….

2. Gender

   a) Male
   b) Female …….

3. Type of mental retardation

   a) Mild mental retardation
   b) Moderate mental retardation

4. Birth order ……

   a) First
   b) Second
   c) Third

5. No. of. Siblings

   a) One
   b) More than one …….

6. Spend time in leisure activity

   a) Yes
   b) No …….

7. Activities of daily living performed by the children

   a) By self

b) With the help of care giver
c) Only by care giver ……..

8. Presence of any medical illness

a) Yes
b) No ……..

9. Any other therapies received

a) Yes
b) No ……

SECTION-B

STRUCTURED OBSERVATORY CHECKLIST FOR MOTOR ACTIVITY ASSESSMENT

S.NO	ITEMS	YES	NO
1.	Claps hands		
2.	Crawls a distance of 5 feet/more		
3.	When made to stand, stands without support.		
4.	Puts small objects in to a container		
5.	Uses thumb and index finger to pick up the objects		
6.	From standing position able to sit		
7.	From sitting position able to stand		

8.	Catches ball		
9.	Throws ball in any direction		
10.	Throws ball atleast 5 feet away from the first bounce		
11.	Walks for minimum 5-10 steps		
12.	Runs for minimum 10 steps		
13.	Climbs up chair		
14.	Jumps off the ground with both feet		
15.	Places rings		

SCORING:

0-5 **:** Severe motor impairment

6-10 **:** Moderate motor impairment

11-14 **:** Mild motor impairment

15 **:** No impairment

PROCEDURE PLAN FOR SENSORY INTEGRATION THERAPY

SENSORY INTEGRATION THERAPY

DEFINITION:

Sensory integration therapy also known as Sensory processing therapy is a therapy in which the therapist may encourage a child with crawling, skipping, playing musical instruments, playing catch and bouncing balls with both hands to help with bilateral integration.

PURPOSES:

Sensory integration activities are the lifeline to providing and achieving the necessary challenges for the child so they maximize:

- daily functioning
- intellectual, social, and emotional development
- the development of a positive self-esteem
- a mind and body which is ready for learning
- positive interactions in the world around him
- the achievement of normal developmental milestones

INDICATIONS:

- Autism
- Asperger's
- SID: Sensory Integration Disorder/Dysfunction
- SPD: Sensory Processing Disorder
- ADHD
- PDD: Pervasive Developmental Disorder
- CAPD: Central Auditory Processing Disorder
- Learning Disabilities
- Mental Retardation
- Other Brain Injuries
- Visual Impairment
- Hearing Impairment
- Anxiety
- OCD

ACTIVITIES OF SENSORY INTEGRATION THERAPY:

The therapy include prism lenses, physical exercise, integration training and sensory stimulation or inhibition techniques such as "deep pressure"—firm touch pressure applied either manually or via an apparatus such as a hug machine or a pressure garment

Skills such as tying shoe laces or riding a bike can be difficult as they involve sequences of movements. Therapy to help in this area may use swimming, mazes, obstacle courses, constructional toys and building blocks.

Encouraging a child with crawling, hopscotch, skipping, playing musical instruments, playing catch and bouncing balls with both hands to help with bilateral integration.

Hand and eye coordination can be improved with activities such as hitting a ball with a bat, popping bubbles, and throwing and catching balls, beanbags and balloons. The building of fine motor skills in children will enable them to perform a variety of important functional tasks.

These include:

- tying shoes
- zipping and unzipping
- buckling and unbuckling
- writing legibly and without any significant muscle fatigue
- playing games that require precise hand and finger control
- drawing, painting, and coloring
- manipulating buttons and snaps
- putting small objects together
- doing puzzles
- placing rings
- using scissors
- manipulating small objects such as coins
- opening and closing objects
- picking up and holding onto small objects
- pinching objects between fingers
- using locks and keys
- being able to isolate finger movements (i.e., using one finger at a time, such as in playing the piano or typing)
- turning things over or turning pages of a book
- screwing and unscrewing
- doing anything that requires small precise hand and finger movements

PROCEDURE:

Sensory integration therapy was carried out by integrating senses such as touch, hearing and vision. Sensory integration was given under three stages:

Stage-1:

Warm up:

In which the child clothing was loosened and shoes were removed.

Stage-2:

Performance phase:

In which the activities were given as follows.

For 1- 6 days,

e) Reaching the objects was carried out. In this the child was asked to crawl and reach the object placed at a distance of 5feet,take the object with his thumb and index finger, walks and sit in a chair placed nearby.

Day 7-11,

f) Hand and eye co-ordination was introduced. In this the child was asked to catch the ball and throw it back.

Next 12-16 days,

g) The activity jumping and clapping were carried out. The child was asked to jump with both feet and then clapped the hands.

Day 17-21,

h) The activity of placing the ring was carried out. The child was asked to place the rings one over the other.

Stage-3:

Wind down:

The children were made to sit and take deep breathing for relaxation

This was carried out 30 minutes a day by 6 groups consisting of 5 children in each for 21 consecutive days.

ANNEXURE -E

CERTIFICATE OF VALIDATION

This is to certify that the tool developed by **Ms.Pricy Monica.M**, Final year M.Sc Nursing student of Sri Gokulam College of Nursing, Salem (Affiliated to The Tamil Nadu Dr. M.G.R Medical University) is validated and can proceed with this tool and content for the main study entitled **"A Study to evaluate the Effectiveness of Sensory integration therapy on motor activity among mentally challenged children at selected special school, Salem".**

Signature with Date

ANNEXURE - F

LIST OF EXPERTS

1. **Dr.C.Babu.MD,**
   Specialist in Deaddition and Child Psychiatry'
   Consultant Psychiatrist,
   Sri Gokulam Hospital, Salem.
2. **Dr. Babu Rangarajan, M.Sc(Psy), M.Phill(PSY)(Child.Psy)., PGDM (CPG), IDGC**
   Child & Clinical Psychologist,
   Neuro foundation,
   Salem.
3. **Mr.T. Jagadeswran, M.OT,**
   Principal,
   JKKMMRF College of Occupational Therapy,
   Komarapalayam
4. **Mrs. Lalitha, M.Sc (N),**
   Vice principal,
   Kongunadu College of Nursing.
   Coimbatore.
5. **Mrs.Nuziba begum, M.SC (N),**
   HOD of Mental Health Nursing,
   Sri Ramakrishna College of Nursing,
   Coimbatore.
6. **Mr. Selvaraj, M.Sc(N),**
   HOD of Mental Health Nursing,
   Shanmuga College of Nursing, Salem.
7. **Mrs. Devi Arul. M.Sc (N),**
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23/12/14

Signature with Date

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Signature with Date

24/06/2014

Dr. BABU RANGARAJAN
M.Sc(Psy). M.Phil (Psy) (Chi. Psy).,
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Child & Clinical Psychologist
மனோதத்துவ நிபுணர் Rcl. CRR No: A 19151.

CERTIFICATE OF VALIDATION

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Signature with Date 7/7/14

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CERTIFICATE OF VALIDATION

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Signature with Date

03/07/14.

(Lalitha. P)

CERTIFICATE OF VALIDATION

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Signature with Date

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No. :
Date :

CERTIFICATE OF VALIDATION

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P. Selvaraj 30/6/14

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06/12/14

Signature with Date

(R. NAGANANDINI)

Head of the Department
Department of Psychiatric Nursing
Vinayaka Mission Annapoorana College of Nursing
SALEM TAMIL NADU.

ANNEXURES - G

CERTIFICATE OF EDITING

TO WHOMSOEVER IT MAY CONCERN

Certified that the dissertation paper titled **"A study to evaluate the effectiveness of Sensory integration therapy on motor activity among mentally challenged children at selected special schools, Salem."** by **Ms. PRICY MONICA M.** It has been checked for accuracy and correctness of English language usage and that the language used in presenting the paper is lucid, unambiguous free of grammatical or spelling errors and apt for the purpose.

Signature
[K.SENTHILKUMAR] Passed in English

CERTIFICATE OF EDITING

TO WHOMSOEVER IT MAY CONCERN

Certified that the dissertation paper titled **"A study to evaluate the effectiveness of Sensory integration therapy on motor activity among mentally challenged children at selected special schools, Salem."** by **Ms.Pricy Monica .M,** It has been checked for accuracy and correctness of Tamil language usage and that the language used in presenting the paper is lucid, unambiguous free of grammatical or spelling errors and apt for the purpose.

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ANNEXURES - H

PHOTOS